

DRAFT
ENVIRONMENTAL ASSESSMENT

**Gray Wolf Damage Management in Idaho
for
Protection of Livestock and other Domestic Animals, Wild Ungulates, and
Human Safety**

Prepared by

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

in Cooperation With

Idaho Department of Fish and Game

and in Consultation With

United States Department of the Interior
US Fish and Wildlife Service
Bureau of Land Management

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ACRONYMS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DAU	Data Analysis Unit
DPS	Distinct Population Segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FONSI	Finding of No significant Impact
ESA	Endangered Species Act
FR	Federal Register
GYA	Greater Yellowstone Area
ID	Idaho
IDAPA	Idaho Administrative code
IDFG	Idaho Department of Fish and Game
ILWOC	Idaho Legislative Wolf Oversight Committee
ISADCB	Idaho State Animal Damage Control Board
IWDM	Integrated Wildlife Damage Management
IUCN	International Union of Nature & Natural Resources or World Conservation Union
LSC	Landowner/sportsmen Coordinator
MOA	Memoranda of Agreement
MOU	Memoranda of Understanding
MT	Montana
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NRM	Northern Rocky Mountains
NWRC	National Wildlife Research Center
RAG	Radio Activated Guard
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services
WY	Wyoming
YNP	Yellowstone National Park

BACKGROUND AND SUMMARY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program and the Idaho Department of Fish and Game (IDFG) have cooperated to prepare this Environmental Assessment (EA) analyzing the potential environmental impacts of alternatives for WS involvement in gray wolf (*Canis lupus*) damage management for the protection of livestock and other domestic animals, wild ungulates, and human safety.

Following the preparation and issuance of an Environmental Impact Statement (EIS) by the U.S. Fish and Wildlife Service (USFWS) (USFWS 1994), the Service introduced gray wolves as nonessential, experimental populations (50 CFR Part 17.84) in Yellowstone National Park and central Idaho in 1995 and 1996 (59 FR 60252-60281)¹. Following this reintroduction, the wolf population in the Northern Rocky Mountains (NRM) steadily increased, and the established biological recovery criteria (≥ 10 breeding pairs per state for at least 3 consecutive years) were reached by 2002 (USFWS et al. 2010). The 1994 10j rules under which wolves were originally reintroduced (59 FR 60266-60281, 50 CFR 17.84(i)) were subsequently revised in 2005 (70 FR 1286-1311) and again in 2008 (73 FR 4720-4736) to provide for increasingly greater management flexibility to deal with problems caused by the growing number of wolves. In the NRM Distinct Population Segment (DPS), 2009 marked the 8th consecutive year that the minimum recovery goal of at least 30 or more breeding pairs and at least 300 wolves were documented in MT, ID and WY. The current NRM wolf population of at least 1,650 wolves in over 100 breeding pairs has far exceeded the originally established biological recovery objectives. On April 2, 2009, the USFWS issued a final rule (74 FR 15123-15188) recognizing the NRM DPS and removing wolves from the ID and MT portions of the NRM DPS from the list of Endangered and Threatened Wildlife². The delisting decision became effective on May 4, 2009, but was subsequently challenged in court and remains in litigation. For a summary of relevant delisting and litigation activities that have transpired, see pages 8-13 in the USFWS 2009 Northern Rocky Mountain Recovery Program Update (USFWS et al. 2010) at <<http://www.fws.gov/mountain-prairie/species/mammals/wolf/>>.

The IDFG's Idaho Wolf Conservation and Management Plan (ILWOC 2002) and Idaho Wolf Population Management Plan 2008-2012 (IDFG 2008a) will be used as the principal guidance documents in managing wolves during the 5-year post-delisting period. These two plans permit more flexibility in addressing wolf damage problems and conflicts than what was permitted while wolves were Federally listed. The IDFG has requested that WS continue its role as a designated agent of the State for managing wolf conflicts. WS would conduct control actions subject to IDFG authorization.³

Four Alternatives for WS involvement in wolf damage management are analyzed in this EA, including the Proposed Action (the Preferred Alternative), which is to continue the current program of wolf damage management, but with the addition of selected new activities and methods. Under the Preferred

¹ This rule established regulations allowing management of wolves by government agencies and the public to minimize conflicts with livestock, and to address impacts on ungulate populations. The USFWS authorized WS to investigate reported wolf predation on livestock and to implement corrective measures, including nonlethal and lethal actions, to reduce further predation.

² The U.S. Fish and Wildlife Service identified a distinct population segment (DPS) of the gray wolf (*Canis lupus*) in the Northern Rocky Mountains (NRM) and delisted gray wolves within NRM DPS boundaries, except in Wyoming. The DPS encompasses the eastern one-third of Washington and Oregon, a small part of north-central Utah, and all of Montana, Idaho, and Wyoming. The States of Montana and Idaho have adopted state laws, management plans, and regulations that meet the requirements of the Act and will conserve a recovered wolf population into the foreseeable future. The USFWS determined that the best scientific and commercial data available demonstrates that the NRM DPS is not threatened or endangered throughout "all" of its range; and the Wyoming portion of the range represents a significant portion of range where the species remains in danger of extinction because of inadequate regulatory mechanisms. Wolves in Wyoming will continue to be regulated as a nonessential, experimental population. 74 FR 15123 (April 2, 2009) pending the outcome of current litigation.

³ IDFG has independent state authority for conducting wildlife management activities, and the actions of state agencies not involving federal funding or federal agency actions are not subject to the requirements of the National Environmental Policy Act. This EA considers the cumulative impacts of independent state actions where appropriate.

Alternative, WS would use and/or recommend the full range of legal, practical and effective nonlethal and lethal methods for preventing or reducing wolf damage while minimizing any potentially harmful effects of damage management measures on humans, wolves, other species and the environment. Prior to the development of this EA, WS' role in wolf damage management has been limited to responding to complaints of wolf damage to livestock and other domestic animals. An additional activity under the Preferred Alternative would be for WS to provide assistance to IDFG in those situations where IDFG has determined that wolf predation is causing unacceptable adverse impacts to an ungulate population in a specific management area, consistent with IDFG's Policy for Avian and Mammalian Predation Management (IDFG 2008a, Appendix C).

Management strategies would be developed for individual situations by applying the WS Decision Model (Slate et al. 1992). When appropriate, farm management practices (animal husbandry), frightening devices and livestock guarding animals would be recommended and utilized to reduce wolf damage to livestock. In other situations, WS might potentially utilize foothold traps, snares, ground shooting, chemical immobilization and euthanasia, and aerial shooting to remove individual problem wolves. An additional potential management method under the Proposed Action would be the infrequent taking of pups in or near the den, in those cases where removal of adult wolves due to chronic depredations on livestock might leave the pups defenseless and subject to starvation. Another potential management method under the Proposed Action, as an alternative to total removal of some chronic depredating wolf packs, would be removal of most or all wolves except the alpha pair from a chronic depredating pack. One (or both if possible) of the alpha animals would concurrently be live-captured, surgically sterilized, radio-collared, and released to maintain and defend their territory against other wolf packs which might be more likely to prey on livestock. This approach would only be considered on a case-by-case basis, and only with the concurrence of IDFG and potentially affected livestock producers.

In determining the most appropriate damage management strategy, preference would be given to nonlethal methods when they are deemed practical and effective (WS Directive 2.101). Lethal methods would be used to reduce damage after practical and appropriate nonlethal methods have been considered and determined to be ineffective or inappropriate in reducing damage to acceptable levels. However, nonlethal methods may not always be applied as a first response to each damage problem, particularly where experience has shown that nonlethal methods in certain circumstances are not practical. The most appropriate initial response to a wolf damage problem could be a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

Another Alternative (the No Action Alternative) involves simply continuing the current Wolf Damage Management program, which includes limits on wolf damage management activities that were established when wolves were Federally classified as either an endangered or threatened species and/or by the special 10j rules under which the nonessential, experimental populations were reintroduced [50 CFR 17.84 (n)]. This Alternative would serve as the environmental base line against which the potential impacts of the other Alternatives are compared (CEQ 1981).

Under a third Alternative, WS would only use and provide advice on nonlethal methods for wolf damage management. Under the fourth alternative considered, WS would not be involved in wolf damage management in Idaho. Limitation of federal actions under these two alternatives would not prevent IDFG and property owners from using lethal methods in accordance with state laws and the Idaho Wolf Conservation and Management Plan (ILWOC 2002) and Idaho Wolf Population Management Plan 2008-

2012 (IDFG 2008a) guidelines. Limitation of federal actions would also not prevent lethal take of wolves under state-authorized and regulated harvest seasons or tribal harvest⁴.

Under the first three Alternatives, WS wolf damage management assistance could be provided on private or public property when: 1) resource owners/managers request assistance to alleviate wolf damage, 2) wolf damage or threats are verified, and 3) agreements or work plans have been completed specifying the details of the damage management action to be conducted. The types of verified wolf or wolf-dog hybrid conflicts that could be addressed would include: 1) depredation/injury of domestic animals, 2) harassment/threats to domestic animals, 3) property damage, and 4) injury and/or potential threats to human safety (*e.g.*, habituated/bold wolves). The Preferred Alternative would additionally allow for the WS program to provide assistance to IDFG to address the impacts of wolf predation on ungulates. All wolf damage management would be conducted in compliance with appropriate Federal, State, and local laws and regulations.

The issues considered for each Alternative include: impacts on the wolf population; effectiveness of nonlethal and lethal control efforts in reducing wolf predation on livestock, other domestic animals and/or wild ungulates; impacts on public and pet health and safety; humaneness and animal welfare aspects of the methods to be used; and sociological issues, including the aesthetic and sociological values of wildlife.

⁴ State wolf population management plans indicate the state would authorize increased wolf harvest levels and/or control actions as needed to reduce livestock depredations and/or address unacceptable impacts on ungulates, as long as wolf population objectives are being met (IDFG 2008a).

CHAPTER 1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

Gray wolf (*Canis lupus*) populations in North America, including the wolf population in Idaho, have undergone dramatic recovery in recent years. In the Northern Rocky Mountains, population growth was hastened by the release of wolves by the U.S. Fish and Wildlife Service into Central Idaho and Yellowstone in the mid-1990s. Idaho's wolf population has far surpassed the biological recovery goals set by the USFWS (Nadeau et al. 2009). The expansion of the wolf population from backcountry areas into areas of greater human use and habitation has increased conflicts between wolves and humans in Idaho (USDA 2010). Conflicts with wolves include predation on livestock and pets, and risks to human health and safety from potentially hazardous or threatening wolves. In some parts of Idaho wolf predation has also become a significant factor in the decline or continued suppression of ungulate (such as elk) populations at levels well below IDFG wildlife management goals. The effect of wolf predation on certain ungulate populations has created conflict, both in terms of the health of the ungulate populations themselves, as well as conflict with people who rely on the hunting of ungulates as a source of food, cultural, and spiritual value (Helm 2008, Mader 2008, IDFG 2009a).

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program Final Environmental Impact Statement (EIS) (USDA 1994) summarized the relationship in North American culture regarding wildlife values and wildlife damage in this way:

“Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife generally is regarded as providing economic, recreational and aesthetic benefits . . . , and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well.”

In Idaho, public attitudes—positive and negative—about wolves have intensified because of the federal government's active role in bringing wolves from Canada to release into Central Idaho and Yellowstone as an experimental population, rather than relying solely upon natural migration for recovery. Prompt, professional management of damage and conflicts of wolves is an important component of wolf recovery efforts because it facilitates local public acceptance and tolerance of wolves (Fritts et al. 1992, Fritts 1993, Mech 1995). One of the best ways to promote wolf recovery may be to encourage education about wolf management issues so that a significant portion of the public would support wolf recovery while tolerating some level of control (Mech 1995).

Wildlife damage management, a specialized field within the wildlife management profession, is the science of reducing damage or other problems caused by wildlife, and is recognized as an integral part of wildlife management (Berryman 1991, The Wildlife Society 2004). The USDA-APHIS-WS program is authorized and directed by Congress to conduct wildlife damage management to protect American agricultural, industrial and natural resources, property and human health and safety from damage associated with wildlife (Act of March 2, 1931 as amended 46 Stat. 1486; 7 USC 426-426c). WS is a cooperatively funded, service-oriented program that provides assistance to requesting public and private entities and government agencies. Before WS responds to requests for assistance and conducts any wildlife damage management, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator for private lands or other comparable documents for public lands must be in place. WS responds to requests for assistance when valued resources are damaged or threatened by

wildlife. Responses can be in the form of technical assistance or operational damage management depending on the complexity of the wildlife problem and the funding that is available. WS activities are conducted in accordance with applicable Federal, State and local laws, Cooperative Service Agreements, “Agreements for Control”, Memoranda of Understanding (MOUs), and other applicable documents (WS Directive 2.210). These documents establish the need for the requested work, legal authorities and regulations allowing the requested work, and the responsibilities of WS and its cooperators.

Under APHIS procedures for implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions considered in this analysis could be, and have been, afforded a Categorical Exclusion (CE) [7 CFR 372.5(c), 60 FR 6000, 6003]. This EA is being prepared to evaluate and determine if there are likely to be any potentially significant or cumulative adverse impacts on the human environment from current or proposed new wolf damage management activities. All WS activities are undertaken in compliance with relevant laws, regulations, policies, orders, procedures and plans, including the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531-1543). The Idaho WS program cooperates with the IDFG and other agencies and groups to address wolf damage conflicts under the guidance in the Idaho Wolf Conservation and Management Plan (ILWOC 2002) and the Idaho Wolf Population Management Plan (IDFG 2008a).

1.2 PURPOSE

The purpose of this EA is to evaluate the potential impacts of Alternatives for managing conflicts with wolves in Idaho. Management activities would be intended to conserve wolf populations while protecting livestock and other domestic animals, ungulate populations, and human health and safety in Idaho. This EA evaluates management of conflicts with wolves, both as a delisted population under IDFG management, and as federally protected under the Endangered Species Act should wolves in Idaho be re-listed.⁵

Wolf damage management activities conducted by the Idaho WS program up to this time have been carried out under NEPA documents previously prepared by the USFWS (USFWS 1994, USFWS 2008) and the WS program (USDA 1996, USDA 2002, USDA 2008, USDA 2009). The EAs prepared for these analyses all resulted in Findings of No Significant Impact (FONSI) for all the proposed activities. One of those documents (USFWS 2008) addressed the potential impacts of lethal removal of wolves to protect ungulates in the three-state (ID/MT/WY) Northern Rocky Mountains Recovery Area. This EA includes analysis of the potential impacts associated with wolf removal to protect ungulates in selected areas of Idaho where IDFG has determined that wolf predation is contributing to unacceptable adverse impacts on an ungulate population. This analysis also examines potential impacts associated with the possible use of surgical sterilization on alpha pairs of wolves in areas with a history of chronic predation on livestock, or in areas where this approach would be consistent with IDFG goals in reducing the impacts of wolf predation on ungulates. Whether or not this approach might ever be implemented would likely depend on a number of factors, including an evaluation of the effectiveness of hunting of wolves by the public as an alternative approach to address wolf damage problems in such areas.

1.3 NEED FOR WOLF DAMAGE MANAGEMENT IN IDAHO

As wolf populations increase and expand their ranges, local decision makers must choose management strategies that balance competing needs for wolf protection and the control of wolf-caused damage (Mech 2001).

⁵ Pending litigation has the potential to return wolves in Idaho to endangered status north of I-90 and nonessential, experimental population status south of I-90. So this EA also evaluates potential WS wolf damage management actions conducted in accordance with federal protections under the ESA.

Understanding of the biology, impacts, and benefits of wolves has increased since reintroduction. The original reintroduction EIS (USFWS 1994) analyzed potential impacts expected to be associated with a fully recovered population of about 100 wolves in Idaho. At the end of 2009, IDFG and the Nez Perce Tribe estimated there were at least 835 wolves in Idaho, more than 8 times the number analyzed for potential impacts in the EIS. The current population level is of particular concern for sportsmen who depend on surplus elk and deer (*Odocoileus* spp.) for harvest, and livestock producers who graze their stock on private and public rangelands.

IDFG manages wildlife populations in Idaho in accordance with federal and state laws and species management plans. Management objectives are established based on conflicts, predator-prey population balance, and maintaining a surplus of game species for harvest. To help with IDFG's implementation of state wolf population management plans (ILWOC 2002, IDFG 2008a), IDFG has requested that WS continue its role as a designated agent of the State for managing wolf conflicts where regulated hunting is unable or impractical to respond to conflicts. In addition to the role WS has performed to date⁶ to respond to wolf depredation on livestock and other domestic animals, IDFG has asked WS to evaluate WS' ability to assist in wolf removal should it become necessary to support ungulate population objectives in accordance with IDFG's Policy for Avian and Mammalian Predation Management (IDFG 2008a Appendix C) and specific Predation Management Plans.

1.3.1 Wolf Damage Management to Protect Livestock and other Domestic Animals

One of the primary reasons that wolf damage management continues to be needed in Idaho is to comply with the commitment made by the Federal government when wolves were reintroduced. The clear intent of the rules under which wolves were reintroduced (50 CFR 17.84(i)), and under subsequent additions to those rules was not only to provide for the recovery and eventual delisting of wolves, but to also concurrently address the damage caused by wolves.

Following the initial issuance of the original (1994) 10j rules for management of the nonessential, experimental gray wolf population in the Northern Rockies, subsequent 10j rules (issued in 2005 and 2008) allowed increasingly greater flexibility and provided for more aggressive control actions to deal with gray wolf depredations on livestock and other domestic animals. At the time of the initial reintroduction of nonessential, experimental wolves to Central Idaho, the USFWS addressed the issue of depredating wolves in their 1994 10j rule [at 50 CFR 17.84(i)(3)(vii)] with this specific language: "*All chronic problem wolves (wolves that depredate on domestic animals after being moved once for previous animal depredations) will be removed from the wild (killed or placed in captivity).*" Significantly, this language did not specify that chronic depredating wolves "may" be removed from the wild, but that they "will" be removed from the wild.

So as early as 15 years ago, when there were relatively few wolves in Idaho, the rules under which wolf reintroduction took place required mandatory removal of chronic depredating wolves. Technically, the 1994 10j rule definition of a chronic depredating wolf involved relocation of depredating wolves, but this approach has not been practiced in any areas of the Northern Rockies for a number of years, since relocation is no longer necessary to ensure viable wolf populations, and since all the suitable wolf habitat is essentially already occupied by wolves. [The USFWS, on page 1294 in their Federal Register notice accompanying the 2005 10j rule (70 FR 1286-1311), provided further rationale for discontinuing relocation of depredating wolves.] Given the increasingly liberal

⁶ While wolves in Idaho south of I-90 were listed under the ESA as a nonessential, experimental population, WS served as a designated agent of US Fish and Wildlife to respond to wolf depredations on livestock and domestic animals prior to 2006. WS continued to perform that role when IDFG assumed management authority of the listed population as a designated agent of USFWS in 2006. WS has continued to assist IDFG in responding to wolf depredation on livestock and domestic animals under the authorities of state law with IDFG's assumption of full management of Idaho's wolf population upon delisting.

allowances for more aggressive control of depredating wolves in subsequent modifications of the original 10j rule, the intent of these rules could be inferred to call for removal of any wolves involved in multiple confirmed depredations on livestock (73 FR 4720-4736).

Whenever WS receives a report of suspected wolf depredation, or of wolves harassing/chasing livestock or livestock guarding animals, WS typically responds by sending a field employee to conduct an on-site investigation. Results of each investigation are documented on WS Form 200, Wildlife Services Depredation Investigation Report (see Appendix B). Specific criteria have been agreed upon by the USFWS, Nez Perce Tribe and WS to classify reported incidents of wolf depredation as either: confirmed, probable, possible/unknown or other (see 2nd page of Appendix B for discussion of these criteria).

The trend in confirmed incidents of wolf depredation on livestock has been a steady increase every year since wolves were initially reintroduced in Idaho (USDA 2010). As wolf conflicts increase, there is an increasing need for prompt professional wolf damage management assistance to maintain public tolerance and acceptance of wolves (Fritts and Carbyn 1995, Mech 1995, Boitani 2003, Fritts et al. 2003, 73 FR 10514, February 27, 2008). Table 1 shows the number of cattle, sheep and dogs confirmed as killed and/or injured by wolves during the 7 most recent calendar years in Idaho (IDFG 2010a).

It is important to recognize that the numbers in Table 1 represent only the minimum numbers of livestock actually killed and injured by wolves, and that many more livestock were probably killed but not confirmed as wolf predation. Wolf predation is only confirmed in those cases where there is enough evidence remaining to determine that wolves in fact killed the animal. In many cases, wolves may have been responsible for the death of a rancher’s livestock, but there was insufficient evidence remaining to confirm wolf predation. In some cases, those portions of the livestock carcass that might have contained the evidence of predation may already have been consumed or carried off. Some of these incidents might be classified as “probable” predation, depending on other evidence that might still remain. But in many cases, there may be little or no evidence of predation, other than the fact that wolves are known to be in the area and some livestock have seemingly just disappeared. Oakleaf et al. (2003) conducted a study on wolf-caused predation losses to cattle on U.S. Forest Service summer grazing allotments in the Salmon, ID area, and concluded that for every calf found and confirmed to have been killed by wolves, there were as many as 8 other calves killed by wolves but not found by the producer. Bjorge and Gunson (1985) likewise recovered only 1 out of every 6.7 missing cattle during their study, and suggested that wolf-caused mortalities were difficult to detect.

Year	Cattle	Sheep	Dogs	Total
2003	7	130	3	140
2004	19	176	4	199
2005	29	166	12	207
2006	41	237	4	282
2007	57	211	10	278
2008	104	215	14	333
2009	76	295	14	385
Total	333	1,430	61	1,824

During Federal fiscal year 2009, WS conducted 226 depredation investigations related to wolf complaints (as compared to 186 in 2008, an increase of almost 22%) (Figure 1-1). Of those 226 investigations, 160 (~71%) involved confirmed depredations, 43 (~19%) involved probable depredations, 16 (~7%) were possible/unknown wolf depredations and 7 (~3%) of the complaints were due to causes other than wolves (USDA 2010). The number of both cattle and sheep killed and injured by wolves in Idaho in Federal fiscal year 2009 was the highest ever recorded. (Note that the figures in Table 1 are based on calendar year, rather than the Federal fiscal year.)

Figure 1-1 shows the increase in the number of wolf packs and the concurrent increase in the number of wolf-related depredation investigations and confirmed and probable incidents of wolf predation on livestock and other domestic animals in Idaho for the 7 most recent Federal fiscal years (USDA 2010).

Figure 1-1. Minimum number of documented wolf packs in Idaho compared to number of depredation investigations, FY 03-09 (USDA 2010).

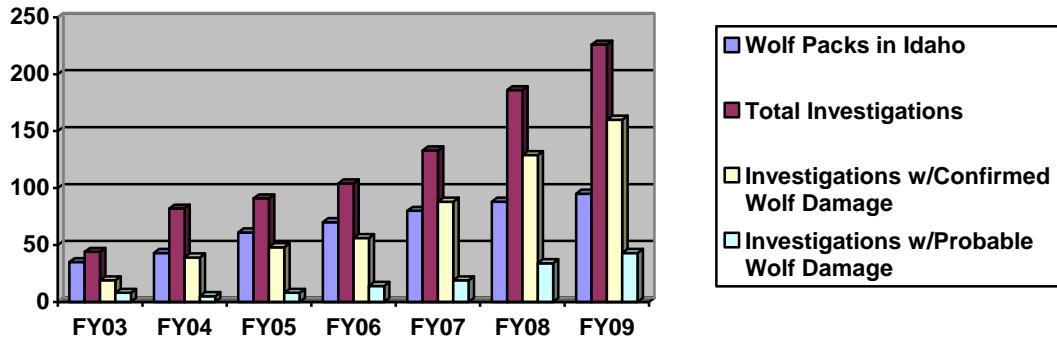
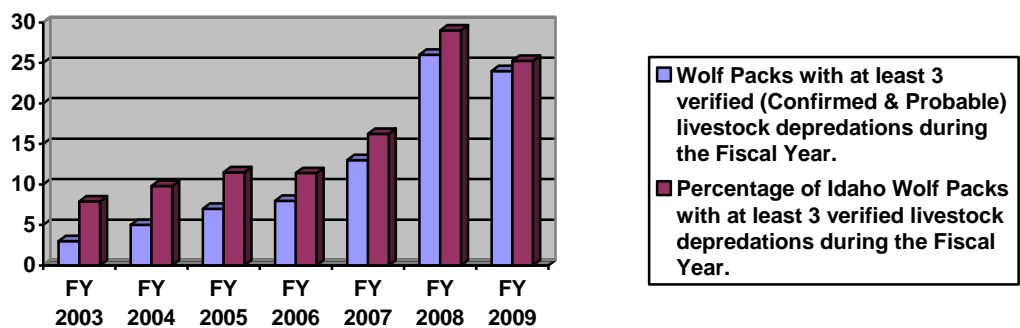


Figure 1-2 shows the increase in both the number of wolf packs involved in 3 or more verified depredations on livestock each year, and the increase in the **proportion** of Idaho’s wolf packs that were involved in 3 or more verified depredations for each of the 7 most recent Federal fiscal years (USDA 2010). The data in Figure 1-2 indicate that the proportion of Idaho’s wolf packs implicated in “chronic” depredations was increasing each year up until 2009. This was likely related to the fact that as the increasing wolf population continued to spread out from Federal lands onto more private land, they were increasingly coming into greater conflict with livestock. The slight decrease in number of chronic depredating packs in 2009 may be related to the fact that WS removed more wolves from chronic depredating packs in the last two years than in any previous years.

Figure 1-2. Number of verified “chronic” depredating wolf packs in Idaho from FY 03-09 (USDA 2010).



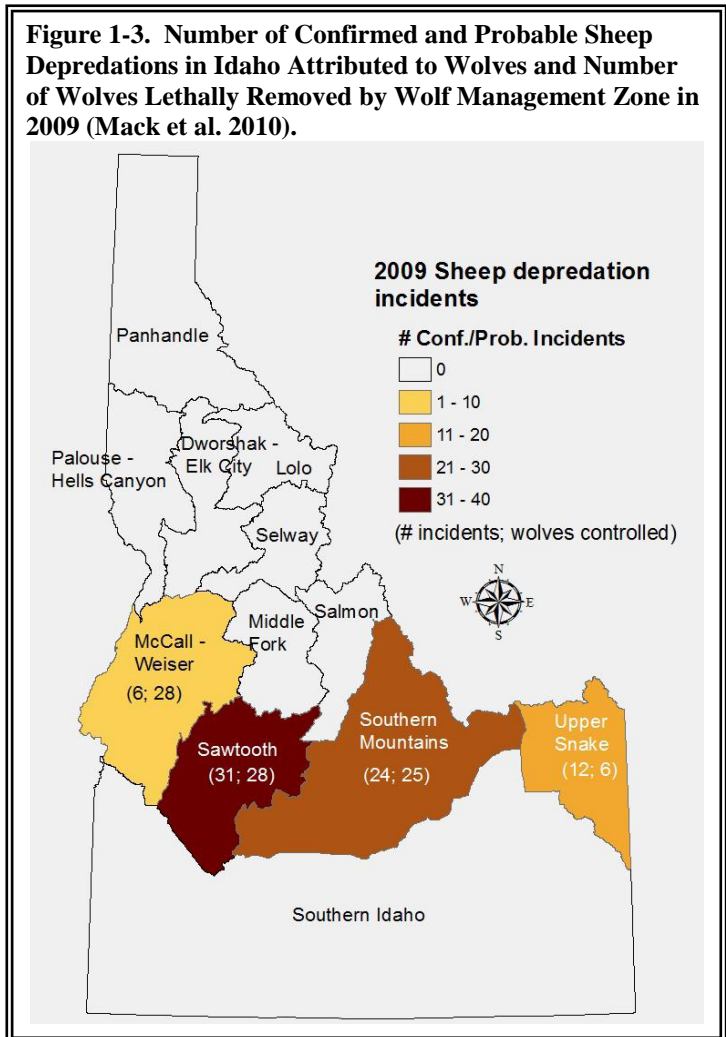
Figures 1-3 and 1-4 indicate which wolf management zones had the highest number of depredations on sheep and cattle in calendar year 2009. (Note that the number of wolves indicated as “controlled” on each map is a combined total in response to depredations on both cattle and sheep.)

Many of the confirmed incidents of wolf predation on livestock in Idaho have involved only one or several animals killed or wounded per incident, but there have also been situations where much larger numbers of livestock have been killed in a single incident, particularly in the case of wolf attacks on sheep. In September, 2003, for example, WS personnel confirmed wolf predation on 61 sheep in a single incident near Riggins, Idaho, and an additional 40 sheep were missing and never found after the night of that attack (USDA 2004). Muhly and Musiani (2009) reviewed data on wolf predation on livestock in Idaho, Montana and Wyoming from 1987-2002 and found that while most wolf attacks on cattle involved the death of only 1 animal per incident, wolf attacks on sheep typically involved killing about 14 animals per incident, with up to 98 sheep killed in a single attack.

Although direct losses of livestock due to predation are often conspicuous and economically significant, they likely underestimate the total impact on producers because they do not consider indirect effects as a result of livestock being exposed to the threat of predation (Howery and DeLiberto 2004, Lehmkuhler et al. 2007). Shelton (2004) suggested that the value of livestock killed by predators is the “tip of the iceberg” in assessing the actual costs that predators impose on livestock and producers including time and effort spent looking for missing livestock, and increased costs associated with efforts to mitigate predation which may include night confinement, improved fencing, additional livestock guarding animals, early weaning, choice of grazing area, and/or increased feeding costs related to loss of grazing acreage.

Harassment by predators may directly cause livestock to lose weight due to increased energy expenditure associated with running and loss of sleep, but may also indirectly reduce the ability of ruminants to convert plant nutrients into weight gain due to decreased rumination time (Howery and DeLiberto 2004). Cattle and sheep exposed to harassment by predators become very skittish and spend much of their time remaining vigilant for predators (Kluever et al. 2008). They do not disperse and feed normally, and therefore may not take in the quantity and quality of feed they would have if unstressed, resulting in reduced weight gains at the end of the grazing season. Cattle are sometimes stampeded through fences and injured when wolves are actively chasing them, and the stress of being repeatedly chased can also cause cattle to abort calves, calf early or give birth to a weak calf (Lehmkuhler et al. 2007).

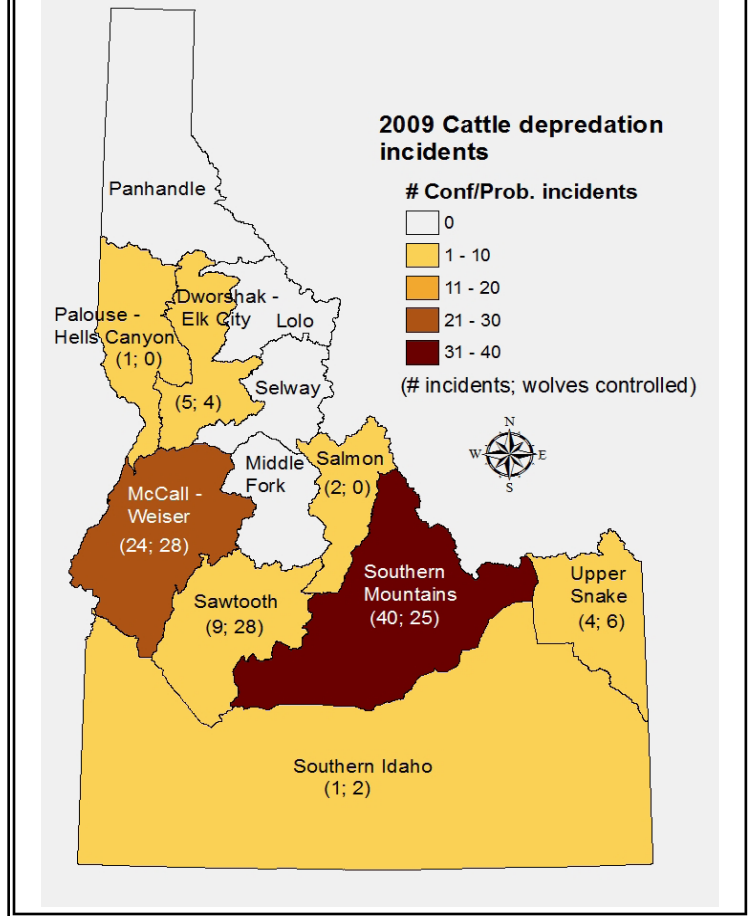
Some wolf advocacy groups have pointed out that, in relative terms, only a very small proportion of livestock losses (<1% for cattle and <2.5% for sheep) are typically caused by wolves, and that other



predators, such as coyotes (*Canis latrans*), are responsible for many more livestock deaths than are wolves (Defenders of Wildlife 2007).

However, it is important to recognize that these relatively low overall levels of loss are occurring with established control programs already in place. It is also important to recognize that even though predation losses due to wolves represent a relatively minor portion of total overall death losses nationwide, these losses are never evenly distributed across the industry (Mack et al. 1992). Most livestock producers will experience no predation by wolves, while some producers in certain areas may suffer significant losses to wolves. Coyotes, by virtue of the fact that their populations are typically many times greater and more widely distributed than the wolf population, do cause more overall predation losses. But assessing the relative likelihood of predation by individual wolves versus individuals of other more abundant and widespread predators provides insight as to why wolf predation is a bigger concern to some livestock producers and wildlife management agencies than is predation by other species.

Figure 1-4. Number of Confirmed and Probable Cattle Depredations in Idaho Attributed to Wolves and Number of Wolves Lethally Removed by Wolf Management Zone in 2009 (Mack et al. 2010).



Collinge (2008) compared reported numbers of livestock killed by wolves and other predators with the estimated statewide populations of the four species most often implicated in predation on livestock in Idaho (*i.e.*, coyotes, wolves, mountain lions (*Puma concolor*), and black bears (*Ursus americanus*). By determining the average number of livestock killed per each individual predator on the landscape, and comparing these figures among the four species, it turns out that individual wolves in Idaho are about 170 times more likely to kill cattle than are individual coyotes or black bears. Individual wolves were determined to be about 21 times more likely to kill cattle than were individual mountain lions. These comparisons highlight the importance of being able to implement effective wolf damage management procedures.

Domestic dogs and cats are occasionally killed and eaten by wolves (Fritts and Paul 1989, Treves et al. 2002). The dogs most often attacked by wolves in Idaho are typically either livestock guarding dogs or hunters' hounds which sometimes encounter wolves during the legal sport hunting seasons for bears and mountain lions. These dogs are often highly valued animals, both from a monetary standpoint and in terms of the human-social bond. Individual livestock guarding dogs may be worth over \$1,000 each, and individual bear and lion hounds are often valued at several thousands of dollars for well trained and experienced animals. Wolves have also occasionally killed or injured pet dogs near

peoples' homes in Idaho and other states, sometimes in the presence of the nearby owners (J. Rachael, IDFG, pers. comm. 2010, <http://www.kidk.com/news/local/17441814.html>).

1.3.2 Potential Role of Wolves in Disease Transmission to Wildlife, Livestock and Humans

Wolves in Idaho are known to have exposure to a variety of diseases, including those caused by viruses (*e.g.*, canine distemper, canine parvovirus, and canine infectious hepatitis), bacteria, and both internal (*e.g.*, intestinal worms of various species, *Echinococcus sp*) and external parasites (*e.g.*, lice and ticks) (IDFG 2008a). A complete list of diseases that wolves in Idaho could encounter would closely mirror diseases present in domestic dogs and coyotes in the state. Wolves that interact with domestic dogs are likely to have higher exposure rates than wolves in remote areas. Wolf populations have the opportunity to develop individual and pack level immunity to some of the common pathogens over time, some of which may be conferred to offspring through maternal antibodies (Gillespie and Timoney 1981). Although diseases can be significant sources of mortality for wolves, they are generally not considered to be limiting at the population level. Despite evidence of ubiquitous exposure, wolves in Idaho demonstrate high recruitment, suggesting long-term stability of the population. Negative effects associated with diseases are unlikely unless the population reaches high density (Kreeger 2003).

The protozoan parasite, *Neospora caninum*, causes abortions in cattle and has been shown to be a large economic loss to the dairy and beef industry with infected animals being three to thirteen times more likely to abort than non-infected cattle (Hall et al. 2005, Trees et al. 1999). Presently, domestic dogs and coyotes are the only two species that have been determined to be able to host and transmit *N. caninum* (Gondim et al. 2004a, b). Canids become infected by ingesting tissues (*i.e.*, placenta, fetuses) contaminated with the organism. They then shed the organism in their feces. A cow grazing on a pasture contaminated with these feces can become infected with *N. caninum* (Dubey 2003).

It has been postulated that wolves are likely to be able to host and transmit *N. caninum* because of their phylogenetic relationship to dogs and coyotes. Gondim et al. (2004b) indicated that 39% (n = 164) of wolves from Minnesota and 11% of coyotes in Utah, Colorado, and Illinois (n = 113) tested positive for exposure to *N. caninum*. Mech (2004, unpubl. data) sampled 11 wolves from five counties in Minnesota from farms with a history of wolf depredation and 8 of 11 (73%) tested positive for exposure to *N. caninum*. Research in Minnesota is currently being conducted to determine if wolves can also transmit viable *N. caninum* in their feces. Although gray wolves may prove to be hosts capable of transmitting *N. caninum*, it is unclear whether the presence of wolves would add to the risk already posed by other canids, and whether or not wolves might play a role in reducing the potential of disease spread as suggested for other ungulate diseases is unproven (Stronen et al. 2007). Data on the rate of seroprevalence of coyotes, dogs, and wolves needs to be defined for a particular geographic region before conclusions can be drawn (Gondim et al. 2004b).

During winter 2009, 17 wolves captured near Jackson, Wyoming were tested for 2 strains of Brucellosis (*Brucella canis* and *B. abortus*). All 17 wolves tested negative for *B. canis* and 15 wolves tested negative for *B. abortus*, but two wolves tested positive for *B. abortus*. To put these test results in perspective, the Supervisory Veterinarian for the Wyoming Game and Fish Department (T. J. Kreeger, DVM, PhD) offered the following comments, "A positive serology titer for *B. abortus* in a wolf means that the wolf had been infected with the bacteria sometime in the past (probably in the last 12 months) and developed an immune response reflected in the antibodies measured by the diagnostic tests. A positive test does not mean that the wolf is currently infected with living bacteria, although it could be. How a wolf became infected by *B. abortus* is speculative. Possible ways of becoming infected include: 1) consumption of a fetus aborted by an infected elk or bison (*Bison bison*); 2) consumption of an adult, pregnant, infected elk or bison (particularly consumption of the reproductive

tract); 3) consumption of an adult, infected, but not pregnant elk or bison (unlikely source); or 4) contact with the environmental site of an aborted fetus (also unlikely). Wolves can become infected with *B. abortus* and transiently shed the bacteria in the feces, although the amount of shed bacteria is thought to be insufficient to infect cattle, elk, or bison” (USFWS 2009).

Foreyt et al. (2009) documented that the tapeworm *Echinococcus granulosus* occurred in 62% of wolves examined in Idaho, and that it was common to find thousands of these tapeworms in each infected wolf. *E. granulosus* requires two hosts to complete its life cycle. Ungulates (deer, elk, moose (*Alces alces*), domestic sheep, and domestic cattle) are intermediate hosts for larval tapeworms which form hydatid cysts in the body cavity, often on the liver or lungs. Canids (dogs, wolves, coyotes, foxes (*Vulpes*, *Urocyon* and *Alopex* spp.) are definitive hosts where larval tapeworms mature and live in the small intestine. Definitive hosts are exposed to larval tapeworms when ingesting infected ungulates. Adult tapeworms, 3-5 mm long, produce eggs which are expelled from canids in feces. Intermediate hosts ingest the eggs while grazing, where the eggs hatch and develop into larvae. Humans are at risk of becoming infected and developing hydatid cysts, primarily through ingestion of eggs which may be present on the fur of infected dogs, wolves or other canids. In Idaho, at least three reports of human infections with *E. granulosus* are known; the earliest dating back to 1938. Throughout the world, most human cases occur in indigenous people with close contact with infected dogs, but hunters and trappers handling wolves, coyotes or foxes may be at increased risk (<http://fishandgame.idaho.gov/cms/wildlife/manage_issues/echinococcus.cfm>).

1.3.3 Wolf Damage Management to Protect Ungulates

The 10j rules under which wolves were reintroduced to Idaho in 1995 and 1996 were revised in 2005 and 2008 to allow states increased management flexibility to address wolf depredations on livestock and “unacceptable impacts” on wild ungulates. With the delisting of wolves, the 10j rules no longer apply, and individual states can conduct wolf management under the provisions of approved state wolf management plans. Under Idaho’s Wolf Conservation and Management Plan (ILWOC 2002), IDFG has an obligation to assure that wolves in increasing numbers do not adversely affect big game populations. Predation pressures on elk and deer are natural sources of mortality that are accounted for in natural systems and not necessarily problematic at some level. Predation may be either beneficial or detrimental to the population, depending on time, location, environmental and habitat conditions, point of view, and other factors.

Wolves are effective predators and scavengers that feed primarily on large ungulates throughout their range (Murie 1944, Pimlott 1967, Mech 1970, Van Ballenberghe et al. 1975, Carbyn 1983, Ballard et al. 1987, Gasaway et al. 1992, Boyd et al. 1994). Kill rates of wolves may vary widely by area and from year to year depending upon primary prey species, prey abundance, and weather conditions, among other factors. Most often the effects on prey populations that are attributable to wolf predation are unknown because of the lack of information on population dynamics of the prey populations and the rates of other mortality sources. However, Kunkel and Pletscher (1999) documented that predation by wolves and other predators (*i.e.*, mountain lions, grizzly bears (*Ursus arctos horribilis*), black bears, coyotes, and humans) on ungulate species in northwestern Montana appeared to be mostly additive to the effect of other mortality factors and that predation appeared to be the primary factor limiting the growth of deer and elk populations.

Ungulates comprise nearly all of the winter diet of most wolves. Of ungulates killed during winter by wolves that colonized northwestern Montana since the mid-1980s, 63% were deer (60% white-tailed deer (*O. virginianus*), and 3% mule deer (*O. hemionus*)), 30% were elk, and 7% were moose (Boyd et al. 1994, Kunkel et al. 1999). Wolves selected white-tailed deer wintering areas and selected deer over elk and moose (Kunkel et al. 1999). An established population of wolves in northwestern

Montana and southeastern British Columbia was responsible for the annual mortality of 6% of female white-tailed deer and 3% of female elk (Kunkel 1997, Kunkel and Pletscher 1999).

In Yellowstone National Park (YNP), elk made up 89% of the 449 kills made by wolves during winters 1995-1997 (Phillips and Smith 1997, Smith 1998). In 2000, 281 elk (87%), 10 bison (3%), 4 moose (1%), 5 deer (3%), 4 coyotes (1%), 1 wolf, and 17 unknowns (5%) were determined to be killed by wolves during the mid-winter observation period. Composition of elk kills was 34% calves, 34% cows, 19% bulls, and 13% unknown. Bison kills included 3 calves, 1 cow, 1 bull and 4 adults of unknown sex. Remains of voles (*Microtus* spp.), ground squirrels (*Sciuridae*), snowshoe hare (*Lepus americanus*), coyotes, bears, insects and vegetation were also found in wolf scats (Smith 1998).

Prey selection and frequency of killing by wolves varies greatly depending on many factors including pack size, snow conditions, the diversity, density, and vulnerability of prey, and degree of consumption of the carcasses (Kunkel 1997). Snow depth and wolf density best explained the annual variation in kill rate in northwestern Montana (Kunkel 1997). Based on studies with the most similar species and diversity of prey (Carbyn 1983, Keith 1983, Boyce 1990, Vales and Peek 1990, Mack and Singer 1992), wolves were projected to kill about 16.5 ungulates per wolf per year in Idaho where they are expected to feed primarily on elk and mule deer (USFWS 1994).

During the first 3 years of an intensive predation study in YNP, wolves killed at a rate equivalent to ~ 10.7 kills/wolf/year during early winter (Phillips and Smith 1997, Smith 1998). The rate increased to ~ 23.3 kills/wolf/year by late winter (Phillips and Smith 1997, Smith 1998). Elk made up 90% of the wolf kills examined. In the first year of a winter predation study near Salmon, Idaho, deer made up only 10% of the prey killed by the Moyer Basin and Jureano Mountain wolf packs during winter, significantly less than their proportion of abundance (Husseman and Power 1999, Husseman 2002). Wolves selected calf elk in excess of their proportion of abundance in the population (Husseman and Power 1999, IDFG 1999).

Carbyn (1987) documented that wolves prey on calf elk in excess of their proportion of abundance in the population. Wolves selected older and younger deer and elk than did hunters in northwestern Montana (Kunkel et al. 1999). Vales and Peek (1990) examined several studies that reported the age structure of deer and elk killed by wolves compared to the estimated age structure of the deer and elk populations. In several studies wolves were documented to take old deer in excess of their proportion of abundance in the population, and wolves tended to take elk calves in excess of their abundance in the population (Kunkel et al. 1999). Husseman and Power (1999) similarly reported wolves taking elk calves in excess of their proportion of abundance in the population. Fifty-eight percent of elk killed by wolves near Salmon, Idaho during winter 1999 were calves (Husseman and Power 1999); whereas, calves comprised approximately 17% of the elk population in the area at that time (IDFG 1999).

Creel et al. (2007) and Christianson and Creel (2010) assessed the impacts associated with risk of wolf predation on the reproductive physiology and demography of elk in the Greater Yellowstone Ecosystem. Their work suggested that elk in areas occupied by wolves spent more time maintaining alertness for the presence of wolves and less time feeding. This change in behavior resulted in negative impacts on body condition and reproductive success of cow elk, with corresponding reductions in calf recruitment into the population. The data from Creel et al. (2007) showed that the reproductive costs of anti-predation behavior can be large, with important consequences for prey dynamics. The authors cautioned that if managers fail to consider these indirect types of effects from wolf predation, decreased elk recruitment could be mistakenly attributed to habitat-related issues.

IDFG has conducted extensive monitoring in elk management zones across the state as part of their ongoing efforts to meet elk population management objectives (IDFG 2009b, 2010b). In some

management zones, there have been indications that predation is one of the primary reasons for declining numbers of elk. Data collected by IDFG in the Lolo and Selway Elk Management Zones indicates that the elk population in these areas is far below historic levels and current population management objectives (IDFG 2010*b*). The data further demonstrate that wolf predation is a primary cause of mortality and is preventing the cow:calf elk component of the population from reaching management objectives. Based on survival data and computer modeling, the Lolo Zone elk population is expected to continue to decline at a rate of 11 to 15% annually unless something can be done to mitigate this decline (IDFG 2009*b*).

In Alaska and various Canadian provinces, wolf populations have been experimentally reduced to improve ungulate population performance (National Research Council 1997). In three instances, wolves were reduced annually to 49-85% of pre-control levels for periods of 5 to 7 years in Aishihik, Yukon (Hayes et al. 2003). Those efforts revealed the potential to dramatically improve ungulate population performance.

IDFG adopted a Predation Management Plan in 2003 for the Lolo and Selway Zones to address predation by black bears and mountain lions and revised this plan in 2010 to address the effects of wolf predation (IDFG 2010*b*). In this Plan, IDFG has proposed an adaptive strategy to reduce the wolf population in the Lolo Zone. Wolves would be removed through regulated public hunting and/or agency removal efforts, to manage for a minimum of 20 to 30 wolves in three to five packs. The level of removal would be dependent on pre-treatment wolf abundance. Using the minimum documented number of 70 wolves in the Lolo Zone (Nadeau et al. 2009), a minimum of 40 to 50 wolves would be lethally removed during the first year. Removal during subsequent years would be lower, but variable, depending on wolf abundance. However, the IDFG would maintain a minimum of 20 to 30 wolves annually in the Lolo Zone for a period of at least 5 years (IDFG 2009*b*). Similar approaches might be exercised in other zones where IDFG determines that wolves are having an unacceptable impact on the elk population.

A review of case studies where wolves were removed to protect ungulates (National Research Council 1997) indicated that such efforts would likely to be effective when the number of wolves is reduced by at least 55% of their pre-control population level over a large area for at least 4 years, when wolves are the primary predator of all age classes of the targeted ungulates, and the weather is favorable for ungulate survival.

In the future, if IDFG were to identify additional areas of Idaho (besides the Lolo and Selway Zones) where wolf predation was having an adverse impact on elk or some other ungulate population, the Proposed Action would include WS activities to assist IDFG with wolf removal in those areas for protection of ungulates. Those efforts would only be conducted under the provisions of approved IDFG management plans which would ensure maintenance of a viable wolf population in Idaho.

1.3.4 Wolf Damage Management to Protect Human Safety

Wolf attacks on humans have been recorded in Russia, Finland, Scandinavia, Germany, India, Afghanistan, Korea, central Asia, Turkey, Iran, and Greenland, but there have been few reported wolf attacks on people in North America (Geist 2008). However, there are reports from areas of North America where wolves have been viewed as threatening to humans or have stalked and attacked people for unknown reasons (*e.g.*, reasons unrelated to disease or injury) (Linnell et al. 2002, McNay 2002). When wolves approach human residences and threaten or kill people's pets or exhibit bold behavior, people often become concerned for human safety. This is especially true if small children are present at those residences.

Linnell et al. (2002) reported several cases from around the world in which non-diseased wolves attacked people, but no humans were killed during the attacks; the wolves, in most cases, were later killed and examined. The wolves involved in those attacks seemed to have acclimated to the presence of people and had become more aggressive toward humans. Fortunately, in many of these incidents, other people accompanying the victims were able to drive the wolf away. In many cases the person attacked received only minor injuries and made a full recovery in a few days to weeks.

There are no verified instances of wolves having attacked and seriously injured people in the lower 48 United States, but a review by McNay (2002) of known case histories of wolf attacks or aggression toward humans in Alaska and Canada, did include 3 incidents from Minnesota. The author noted that incidents of wolves behaving aggressively towards humans are rare, and that for much of the 20th century there were no documented cases of wolves killing or seriously injuring a person in North America. McNay (2002) provided case histories for 11 instances of what he considered unprovoked incidents of aggressive behavior of wolves which resulted in no injury (4) or minor injuries (7) over the period of 1969-1993, and evidence of 7 cases of unprovoked wolf aggression over the period of 1994-2000, 5 of which involved wolves inflicting severe bites on humans.

In January of 2005, an individual was attacked by a wolf while jogging near the community of Key Lake in northern Saskatchewan, Canada. The man was able to fight off the animal and later was flown to a hospital for stitches to non-life threatening injuries (CBC News 2005). In July 2007, a kayaker in a remote area of the North Coast in British Columbia, Canada was attacked by an old female wolf (Pynn 2007). The kayaker was able to stop the attack by repeatedly stabbing the wolf with a knife. The individual called for help on his marine radio and the wolf was shot by the individuals who came to rescue the kayaker. In this instance, there was no indication that the wolf had been fed or otherwise habituated to humans

There have been 2 documented fatal attacks on humans by wolves in North America in recent years. The first fatal attack occurred in November 2005 near Points North, Saskatchewan (McNay 2007) and the other in March 2010 near the village of Chignik Lake, Alaska. In the first case, evidence suggested several local wolves had become habituated to people, and the victim was attacked while out walking alone in a wooded area. Those wolves had been feeding on the victim's body before searchers found the victim's remains. In the second case, Alaska officials concluded wolves killed a 32-year-old woman as she was jogging along a gravel road near the town of Chignik Lake, on the Alaska Peninsula (http://www.msnbc.msn.com/id/35913715/ns/us_news-life/).

McNay (2002) reported that in most instances where naïve wolves behaved aggressively toward humans, the humans defended themselves by hitting the wolf with a heavy object, firing a rifle into the air or, in two instances, killing the wolf. None of the individuals who were bitten by habituated wolves defended themselves with anything other than their voices, hands or arms. It was difficult to determine if food conditioning (wolves learning to associate humans with the availability of food) played a role in all cases. However, 6 of the 11 aggressive habituated wolves were known to be food conditioned. It was unlikely that the naïve wolves were food conditioned because all of those incidents occurred at sites well away from human use areas. With a growing wolf population and many people living in occupied wolf range, opportunities for wolves to become habituated to humans and risks of adverse interactions between humans increase. The data provided by McNay (2002) indicates the importance of human behavior management and public education programs in the prevention of adverse human-wolf encounters. These efforts coupled with nonlethal techniques designed to reduce or prevent wolf habituation to humans will likely prevent or resolve most situations where wolf behavior causes concern for human safety. However, there may be instances where removal of a bold, habituated wolf may be deemed necessary to reduce a human safety risk.

Wild wolves rarely contract rabies, but it is possible, and there is a serious concern for humans or their pets should they be bitten. McNay (2002) reported 2 people that died as result of bites from wolves with rabies in Alaska in the 1940s. In 2007, a pack of wolves attacked a group of sled dogs and strays in Marshall, Alaska (Pemberton 2007). The one wolf that was killed by villagers during the attack tested positive for rabies. All dogs involved in the incident were euthanized as well as free roaming dogs that may have been involved in the incident. In response, villagers and government officials were working to increase use of rabies vaccine and fenced enclosures for dogs. This type of incident is relatively uncommon, and rabies is rare in wolves south of the arctic in North America.

1.4 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL AND MANAGEMENT DOCUMENTS

1.4.1 WS Programmatic EIS

WS issued a programmatic EIS which analyzed all wildlife damage management activities conducted by the WS program (USDA 1994) and a Record of Decision for the programmatic EIS was issued in 1995. This EA incorporates information by reference from USDA (1994).

1.4.2 Final EIS on the Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho

The USFWS (1994) issued a Final EIS and Decision regarding the potential impacts of reintroducing wolves to YNP and Central Idaho. Part of the analysis in the EIS assessed potential impacts of a fully-recovered wolf population on livestock, ungulate populations, and hunter opportunity. This EIS also assessed the anticipated impact of wolf removals for protection of livestock. Relevant analysis from USFWS (1994) is incorporated by reference in this EA.

1.4.3 Environmental Assessment for Proposed Revision of Special Regulation for the Reintroduction of Gray Wolves into the Central Idaho and Yellowstone Areas

The USFWS (2008) issued a Final EA and Decision in January 2008 on proposed changes to the 2005 10j rule [50 CFR 17.84(n)] which would allow greater flexibility in managing wolves that had been shown to be having an unacceptable adverse impact on ungulate populations. The USFWS EA assessed the ecological and other impacts related to the potentially increased take of wolves for protection of ungulates and people's dogs. The Proposed Action in this EA includes some of the same wolf damage management activities which were analyzed in the USFWS EA, and relevant analysis from that document is incorporated by reference in this document.

1.4.4 Wolf Conservation and Management Plan

The Idaho Legislative Wolf Oversight Committee (ILWOC) prepared the Idaho Wolf Conservation and Management Plan (ILWOC 2002) which was approved by the 56th Idaho Legislature, Second Regular Session in March 2002. The goal of this conservation and management plan is to ensure the long-term survival of wolves in Idaho while minimizing wolf-human conflicts that result when wolves and people live in the same vicinity. Wolf control actions included within the Proposed Action / Preferred Alternative in this EA would be consistent with the provisions of the Idaho Wolf Conservation and Management Plan (ILWOC 2002).

1.4.5 Idaho Wolf Population Management Plan

The IDFG involved a wide variety of stakeholder groups in the development of the Idaho Wolf Population Management Plan (IDFG 2008a). The plan was developed to provide a management framework for state management of the gray wolf population during the 5-year period following

delisting of wolves (See more detail summary below). The plan provides for the long-term viability of Idaho's wolf population, and wolf damage management as proposed under the Preferred Alternative in this EA would be consistent with the provisions of the Idaho Wolf Population Management Plan (IDFG 2008a).

1.4.6 Environmental Assessment for Predator Damage Management in Southern Idaho

USDA (2002) issued an EA and FONSI regarding predator damage management activities conducted by the USDA-APHIS-WS program in southern Idaho. That EA included analysis of actions and methods to address wolf predation on livestock. Some aspects of that analysis remain relevant to current wolf damage management activities as practiced under the No Action Alternative, including the analysis of potential impacts to threatened and endangered species, and the analysis of potential impacts associated with most of the same tools and methods currently used during wolf damage management activities.

1.4.7 Environmental Assessment for Predator Damage Management in Northern and Central Idaho

USDA (1996) issued an EA and FONSI regarding predator damage management activities conducted by the USDA-APHIS-WS program in northern and central Idaho. That EA included analysis of actions and methods to address wolf predation on livestock. Some aspects of that analysis remain relevant to current wolf damage management activities as practiced under the No Action Alternative, including the analysis of potential impacts to threatened and endangered species, and the analysis of potential impacts associated with most of the same tools and methods currently used during wolf damage management activities.

1.4.8 Annual Monitoring Reports for WS Predator Damage Management EAs

Since completion of the above-described WS EAs, the Idaho WS program has prepared annual monitoring reports to review relevant data regarding WS predator damage management, including wolf damage management. All of these monitoring reports have continued to show that WS predator damage management is having no significant adverse effects on the quality of the human environment.

1.4.9 Categorical Exclusion Records for WS Wolf Damage Management in Idaho

In addition to the above-described EAs and annual monitoring reports prepared by WS, categorical exclusion records were prepared in 2009 and 2010 for wolf control actions expected to be conducted in the IDFG-established wolf management zones where wolf predation on livestock had previously occurred. These documents analyzed the potential impacts of wolf removals expected to occur in response to depredations on livestock under the current program of wolf damage management. These analyses all indicated that expected wolf control actions would cause no significant impacts on Idaho's overall wolf population, or on the populations of any nontarget species.

1.4.10 Substantial Impairment Analyses Prepared by the Sawtooth National Forest to Assess the Potential Impact of Grazing-Related Issues on Wolves in the Sawtooth National Recreation Area (SNRA)

In compliance with the requirements of the SNRA Organic Act and NEPA, the Sawtooth National Forest prepared analyses in 2003 to determine whether administration of livestock grazing on SNRA lands might "substantially impair" wolves or wolf-related recreational opportunities. The 2003 analysis (and accompanying 2004 Record of Decision) were reviewed in 2010, based on additional

new information available since completion of the original analysis. Both the original analysis and the 2010 review determined that grazing related issues, including wolf damage management, were not substantially impairing wolves or wolf-related recreation in the SNRA. The analysis in this EA will be reviewed for consistency with the conclusions of the substantial impairment analyses prepared by the Forest Service for the SNRA.

1.4.11 Memorandum of Agreement (MOA) between the Secretary of the Interior, through the USFWS, and the State of Idaho

This MOA was established to facilitate an orderly transition from Federal management to state management and to further enhance the conservation of the gray wolf. Under the 10(j) rule and this agreement, the IDFG became the USFWS' designated agent to manage wolves in Idaho. The MOA continues to provide for the cooperation of IDFG with USDA-APHIS-WS in responding to incidents of wolf damage to livestock and other resources.

1.4.12 Memorandum of Understanding Between IDFG and the Idaho State Animal Damage Control Board (ISADCB)

The most recent version of this MOU was signed in 2006. It outlines the roles and responsibilities of IDFG and WS in dealing with a variety of wildlife damage problems in Idaho, including wolf damage problems. Wolf damage management following delisting would be consistent with the terms of an MOU between IDFG and ISADCB (IDFG and ISADCB 2006). Any actions conducted under either the Proposed Action or the No Action Alternative would be consistent with the guidance in this MOU. Under the other two alternatives, WS would not be able to fulfill all of its commitments for wolf damage control under the MOU, either providing only advice on possible control methods or not being involved in wolf management at all.

1.4.13 National Forest Land and Resource Management Plans (LRMPs)

Before an Alternative can be considered for implementation on National Forest Service System lands, it must be consistent with the LRMP or "Forest Plan" for that Forest. If the Alternative is consistent with the LRMP, no additional action would be necessary by the U.S. Forest Service.

If an Alternative that is inconsistent with the LRMP is selected, the U.S. Forest Service could amend the LRMP to be consistent with the EA, or elements of that Alternative could be modified when operating on that Forest. The decision would not be implemented on U.S. Forest System lands until the inconsistency is resolved either through amendment of the LRMP or modification of the Alternative. Any inconsistencies would be identified and resolved before the wolf damage management project is conducted on National Forest system lands. A work plan would be developed by WS with each National Forest before any wolf damage management is conducted, or in rare instances under *emergency control only*. Wolf management on National Forest System lands in Idaho would only be considered after consultation between the U.S. Forest Service, IDFG, and WS.

1.4.14 BLM Resource Management Plans (RMPs)

The BLM currently uses RMPs to guide land use decisions and management actions on lands they administer. Any decision made as a result of this EA process will be consistent with guidance in these RMPs regarding WS activities. If change in an RMP is deemed appropriate by BLM and WS to better facilitate accomplishment of agency missions, amendment of an RMP may be considered.

1.5 IDFG PLANNED MANAGEMENT DIRECTION AS DESCRIBED IN IDFG (2008a)

The goal of the IDFG Wolf Population Management Plan (IDFG 2008a) is to ensure that populations are maintained at 2005-2007 population levels (518-732 wolves) during the 5-year post-delisting period through adaptive management under the guidelines of the 2002 State Plan. The Idaho Fish and Game Commission has further clarified that the statewide wolf population objective should be to maintain numbers near the lower end of that range, or around 518 wolves (IDFG 2009a). Consistent with the delisting rule, the state goal is to ensure the long-term viability of the gray wolf population. In order to ensure the population goal, IDFG will maintain ≥ 15 breeding pairs (floor threshold), maintain balanced wolf and prey populations, and ensure genetic transfer among states through maintaining connectivity and functional metapopulation processes. IDFG will also manage wolves to minimize conflict with humans and domestic animals.

Secondarily, the IDFG goal of maintaining harvest opportunity for wolves is an important component. Ideally, population objectives should also reflect ability to monitor packs, breeding pairs, and total wolves, as well as harvest and monitoring objectives in neighboring states. Therefore, the long-term objective is to maintain viable wolf populations in the state, achieve short-term harvest goals to reduce conflicts, provide annual harvest opportunity, and provide for non-consumptive benefits. Based on stakeholder input, the most important objective within the management plan will be conflict resolution, when populations meet or exceed the population goal of the plan (IDFG 2008a). Future population goals will reflect knowledge gained each year. However, the statewide population will range between the 2005 and 2007 levels and not be allowed to fall to a level where management of conflicts has to be restricted (< 15 breeding pairs). Furthermore, optimal hunting opportunity and flexibility in conflict resolution can be achieved by maintaining > 20 breeding pairs. Twenty breeding pairs is not an objective, nor is it a prejudgment about the population level of wolves necessary to avoid conflict. It is only a management trigger that will require additional protections to ensure the wolf recovery goal is maintained (IDFG 2008a).

1.5.1 Statewide IDFG Goals and Objectives

Under IDFG policy, several objectives identified in the IDFG strategic plan, “The Compass” are incorporated in the IDFG Wolf Population Management Plan. The IDFG (2008a) objectives are guided by several overarching objectives:

1. Manage for a self-sustaining, viable wolf population that provides for a diversity of values and uses.
2. Manage wolves as part of the native resident wildlife resource.
3. Provide for resident wolf populations interchange with wolves from adjacent states/provinces as part of a larger metapopulation.
4. Allow wolves to persist where they do not cause excessive conflicts with humans or human activities.
5. Maintain > 15 breeding pairs⁷.
6. Manage wolf populations so that wolf numbers will not adversely affect big game populations or the economic viability of those who depend on big game animals.
7. Minimize wolf/human conflicts and adverse impacts where they occur.
8. Establish a strong and balanced public education program.

⁷ The recovery goals for delisting and state minimum objectives are based on breeding pairs, not packs. The 2002 State Plan used packs and breeding pairs interchangeably and did not define a pack. The delisting rule requires maintenance of ≥ 10 breeding pairs, and that all 3 states collectively maintain ≥ 30 breeding pairs. However, Idaho has committed to maintaining ≥ 15 breeding pairs.

1.5.2 Livestock Damage Management

The damage management program would be governed by Idaho Statute and monitored by the Fish and Game Advisory Committee. IDFG employs a Landowner/Sportsmen Coordinator (LSC) biologist in each region. Regional LSC staff will work directly with wolf biologists and US Forest Service, BLM, and WS personnel to reduce impacts on producers, livestock, and wolves. The LSC biologist oversees landowner relations and reviews wildlife complaints and depredations. Typical LSC duties involve handling complaints from landowners and devising nonlethal techniques to reduce impacts from big game. The LSC programs have been effective at reducing impacts from bears on apiaries; reducing impacts from deer and elk on grain and legume fields; and providing fencing materials, noise makers, and a variety of depredation reduction techniques and equipment across the state. Should lethal techniques be required, the Regional Supervisor will coordinate with WS to authorize management activities and/or contact hunters to assist in lethal removal of wolves (IDFG 2008a).

1.5.3 Regulated Sport Harvest^{8,9}

Hunting activities will likely reduce conflicts between wolves and livestock to some degree, but will probably not replace the need for agency control activities¹⁰. Conflict resolution procedures will follow protocols similar to those that have been in place since 2005 and take into account population objectives within the Data Analysis Unit¹¹ (DAU) and landowner and producer concerns. During established seasons, IDFG will make efforts to enlist hunters to remove problem wolves. Outside of established seasons, depredation hunts would be used when and where feasible to remove wolves involved in depredations. Intensity and timing of removal will be determined by IDFG based on wolf population status in a DAU or wolf management zone (IDFG 2008a).

1.5.4 Population Monitoring

The USFWS developed a post-delisting monitoring plan and delisting rule that requires Idaho, Montana, and Wyoming to maintain ≥ 30 breeding pairs and ≥ 300 wolves well distributed among the three states, including ≥ 10 breeding pairs and ≥ 100 wolves in each state. During the first 5-years following delisting, intensive monitoring will be conducted annually to ensure the wolf population in Idaho is maintained at ≥ 15 breeding pairs (ILWOC 2002). If any of these thresholds are not met, the USFWS would initiate a status review to determine if relisting is necessary. Thus, IDFG and the Nez Perce Tribe will continue annual monitoring to quantify the number of packs, breeding pairs, and total number of wolves in Idaho (IDFG 2008a). To assist with monitoring, IDFG will maintain an adequate sample of radio-collared wolves during the 5-year post delisting period to demonstrate that ≥ 15 breeding pairs are maintained at the end of the year¹².

⁸ To determine appropriate harvest levels of wolves, IDFG will continue to verify wolf pack activity and estimate wolf populations.

⁹ An agreement between the Governor of Idaho and the Nez Perce Tribe Executive Committee completed in 2005 addresses tribal harvest on the Nez Perce Reservation and within the open and unclaimed lands within the treaty territory as identified under treaty rights (IDFG 2008a).

¹⁰ Wolf damage management actions are described by the MOU between IDFG and ISADCB, both for the delisted population and for the population as it was listed previously (IDFG and ISADCB 2006).

¹¹ Depending on species, Game Management Units are grouped into larger DAUs or Zones that reflect habitat conditions, populations, land management, and other management considerations. Large carnivore populations are managed by IDFG using DAUs and population objectives revolving around high, moderate, and low harvest regimes that generally reflect inversely-related objectives of low, moderate, and high population levels, respectively.

¹² Recent development of a surrogate method for determining breeding pair status based on pack size (Mitchell et al. 2008) may reduce the level of monitoring intensity required to verify minimum breeding pair status. In essence, a historical record now exists that provides a correlation between pack size and the probability of that pack meeting the definition of a breeding pair. As pack size increases, the probability that the pack meets breeding pair status increases.

Currently, wolf population estimates in Idaho are generated by using extensive information derived from radio-collared individuals. Biologists also derive estimates of reproduction, mortality, pack size, pack territories, habits, and other variables. This information, combined with public observation records and intensive field efforts, is used to verify new pack activity and develop a statewide population estimate (Nadeau et al. 2007, 2008, 2009; Mack et al. 2010).

1.6 DECISION TO BE MADE

Based on agency relationships, MOUs and legislative direction, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The IDFG, Idaho State Department of Agriculture, USFWS, US Forest Service, BLM, Idaho Department of Lands, and the Nez Perce Tribe all had opportunity for input during preparation of the EA to ensure an interdisciplinary approach in compliance with NEPA and agency mandates, policies and regulations.

Based on the scope of this EA, the decisions to be made are:

- Should the Idaho WS program continue its involvement in wolf damage management activities as currently practiced, or should program activities be expanded or reduced?
- What mitigation measures should be implemented or continued by WS?
- Would the proposed action have significant impacts on the quality of the human environment and therefore require preparation of an EIS?

1.7 SCOPE OF THIS ANALYSIS

1.7.1 Actions Analyzed

This EA evaluates Idaho WS wolf damage management activities to protect agricultural and natural resources, property, and human and animal health and safety as coordinated with and in cooperation with IDFG and other agencies and the public. The scope of this EA is limited to evaluating the potential impacts of Alternatives for WS involvement in wolf damage management in Idaho.

One important point is that WS wolf control activities are conducted only at the request of IDFG and/or affected property owners, subject to IDFG authorization. Wolf management goals are established by State entities in the Idaho Wolf Conservation and Management Plan (ILWOC 2002) and the Idaho Wolf Population Management Plan (IDFG 2008a). NEPA does not apply to State entities, and IDFG would be implementing the management direction in these documents with or without the involvement of WS. The content and policies established in these documents are therefore outside the scope of this EA.

1.7.2 American Indian Lands and Tribes

Wolves play an important role in some tribal culture and beliefs, but the exact nature of this relationship and role varies among tribes. The state agencies and WS recognize the importance of wolves in tribal culture and will continue to work with individual tribes to try and address their concerns regarding human/wolf conflict reduction actions in Idaho. WS would only conduct wolf damage management activities on tribal lands at the request of the tribe and only after appropriate authorizing documents were signed. WS has cooperated with the Nez Perce Tribe in their wolf monitoring and management efforts since their initial involvement in these activities beginning with the reintroduction of wolves to central Idaho.

1.7.3 Period for which this EA is Valid

This EA will remain valid until WS and other appropriate agencies determine that new needs for action, changed conditions, or new Alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Monitoring and review of wolf damage management activities and any associated take of wildlife will be conducted each year to ensure that the impacts of the program are within parameters analyzed in the EA.

The USFWS decision to remove wolves from the Federal list of threatened and endangered species has been challenged in court. If the court determines that wolves should be returned to their status as endangered (north of I-90) and/or nonessential, experimental (south of I-90), wolf damage management would be conducted under the provisions of applicable Federal rules and plans. This would include the USFWS 2008 10j rule (50 CFR 17.84) for nonessential, experimental wolves (south of I-90) and the USFWS 1999 “Interim Wolf Control Plan for Northwestern Montana and the Panhandle of Northern Idaho” for endangered wolves (north of I-90).

1.7.4 Site Specificity

This EA analyzes the potential impacts of wolf damage management on all public and private lands in Idaho where wolf conflicts might potentially occur.

Planning for the reduction of human/wolf conflicts is conceptually similar to Federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire departments, law enforcement agencies, and emergency response organizations. Although some of the sites where wolf damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever wolf conflicts and resulting management occurs, and are treated as such. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS (see Chapter 3 for a description of the Decision Model and its application). The analyses in this EA are intended to apply to any WS wolf management action that may occur in any locale and at any time within Idaho. In this way, WS believes the EA meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to meet needs for assistance with wolf damage management in a timely fashion.

This EA addresses the impacts of wolf damage management in areas where control activities have already occurred, and in areas where additional control activities might occur in the future. Because the proposed action is to reduce damage and because the program’s goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional wildlife damage management efforts could occur. The EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

1.7.5 Summary of Public Involvement

Issues related to the proposed action were initially developed by WS, based on an awareness of issues that have previously been raised regarding predator damage management in general, and wolf damage management in particular. As part of WS’ environmental analysis process, and as required by the Council on Environmental Quality (CEQ 1981) and APHIS-NEPA implementing regulations, this

document and its Decision will be made available to the public through “Notices of Availability” (NOA) published in local media, on the APHIS website and through direct mailings of NOA to parties that have specifically requested to be notified. The EA will also be available on the APHIS website (<http://www.aphis.usda.gov/regulations/ws/ws_environmental_idaho.shtml>). Any new issues or Alternatives identified during a 30-day public comment period for this EA will be fully considered to determine whether the EA should be revised prior to issuance of a final Decision. Public notification regarding the availability of any Decision associated with this EA will be identical to that used for the EA.

1.8 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of 3 more Chapters and 3 Appendices. Chapter 2 discusses the issues, issues not analyzed in detail, and the affected environment. Chapter 3 describes each Alternative, alternatives not considered in detail and Standard Operating Procedures (SOPs). Chapter 4 analyzes the environmental impacts associated with each Alternative considered in detail. Appendix A is a list of preparers, consultants and reviewers. Appendix B is a copy of the investigative report form used by WS personnel to document wolf depredation investigations, and Appendix C is the list of literature and references cited.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

2.1 INTRODUCTION

Chapter 2 contains a discussion of the issues relevant to the analysis, including issues that will receive detailed environmental impact analysis in Chapter 4 (Environmental Consequences) and issues not considered in detail, with rationale. Pertinent portions of the affected environment are included in this chapter in the discussion of issues to be addressed in detail. Additional information on the affected environment is incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the current program.

The identified issues have been or could be concerns of the public and/or professional communities about environmental impacts which might potentially occur as a result of proposed wolf damage management activities. Issues relating to the management of wildlife damage were raised during the scoping process in preparing USDA (1994) and during the interdisciplinary approach used in preparing this EA.

2.2 AFFECTED ENVIRONMENT

Idaho has a diverse landscape containing large expanses of high quality wolf habitat (IDFG 2010a). Central Idaho includes three contiguous Wilderness Areas; the Selway-Bitterroot, Frank Church River-of-No-Return, and Gospel Hump encompassing almost 4 million acres, which represent the largest block of Federally-designated wilderness in the lower 48 states. Outside of Wilderness Areas, land ownership and human use patterns result in varying levels of potential human conflict with wolves. Southern Idaho includes the vast Snake River Plain, which is predominantly private agricultural land and also contains most of Idaho's urban centers. Three major mountain chains and two large river systems help blend these very different landscapes together, many of which are managed for multiple uses. A moisture gradient also influences habitats of both wolves and their prey, with maritime climates in the north supporting western red cedar (*Thuja plicata*)-western hemlock (*Tsuga heterophylla*) vegetation types, transitioning into continental climates of Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) to the south. Elevations vary from 1,500 feet (457 meters) to just over 12,000 feet (3,657 meters). Annual precipitation varies from less than 8 inches (20 centimeters) at lower elevations to almost 100 inches (254 centimeters) at upper elevations.

The proposed action would include wolf damage management activities on any private and/or public lands in Idaho where wolf damage is occurring or could occur, and where a request has been received and a need is present. Wolves historically occurred in all of the NRM DPS, however, much of their historical range has been modified for human uses (*i.e.*, housing, roads, industry, agriculture). However, wolves are currently well distributed across Idaho from the Canadian border, south to the Snake River Plain, and from the Washington and Oregon borders east to the Montana and Wyoming borders (Mack et al. 2010). Of the 94 documented packs present at the end of 2009, territories of most were predominantly on Forest Service lands.

Central Idaho is a relatively undeveloped area due to: 1) land-use classifications and management guidelines for species such grizzly bears and Canada lynx; 2) access; and 3) geological characteristics (Serhveen et al. 2003, USFS 2006, USFWS 2007a). IDFG manages resident ungulate populations to maintain them at densities compatible with habitat conditions and to provide for hunter harvest. IDFG ungulate management plans commit them to continue this practice into the future (IDFG 2008a, Mack et al. 2010). Cattle and sheep are present in western, southern, and eastern Idaho, but are present in relatively low numbers or are absent in central Idaho wilderness areas and the Panhandle.

Human growth and development are expected to continue in the NRM and Idaho, including development and conversion of private low-density rural lands to higher density urban developments, road development, industrial and business facilities, resource extraction, and more recreation on public lands. However, the vast majority of suitable wolf habitat and the current wolf population are secure in mountainous forested public land that will not be legally available for or suitable to intensive human development. Wolves do not necessarily avoid roads, and in fact readily use forest and logging roads for travel corridors, but road density apparently provides a good measure of human contact which can result in illegal wolf mortality. When wolves occur at low densities and large blocks of unoccupied suitable habitat are available, habitat and road density characteristics predict areas where wolves will occur (Mladenoff et al. 1995); however, as wolf densities increase vegetation and habitat characteristics do not predict wolf habitat as well as indices that measure human influence as long as prey is adequately abundant (Potvin et al. 2005, Robbins 2007). Despite efforts to minimize impacts to wildlife (Brown 2006), some of this development will make some of Idaho less suitable as wildlife habitat. However, wolf habitat does not appear to be greatly affected by human-land uses such as snowmobiling, off-roading, or logging activities, except when they result in accidental or intentional killing of wolves or changes to prey density (Fuller et al. 2003). If the wolf population is large enough however, even when these factors have an adverse affect on individuals, the activities seem to have little effect on the wolf population as a whole. Wolf populations have a remarkable ability to persist as long as they have an adequate food supply, despite being subject to multiple mortality factors, and even small populations of wolves have persisted and increased in several areas of the world in the last three decades. (Fuller et al. 2003).

Although no significant threats to suitable wolf habitat in Idaho are known to exist in the foreseeable future, wolf managers will be required to regulate human harvest and illegal mortality, and manage conflict resolution (73 FR 10514-10560, Smith et al. 2010). None of the human-use developments or increased human presence threatens wolf recovery or meaningfully impact the amount of suitable wolf habitat in Idaho or the NRM in the foreseeable future (Robbins 2007, 73 FR 10514-10560). Wolves are a habitat generalist and one of the most adaptable large predators in the world, and only became extirpated because of deliberate human persecution (Boitani 2003, Fuller et al. 2003). Cultural, economic, social, legal, and other components of the affected environment are given further consideration in Section 2.3.5 of this chapter and in Chapters 3 and 4.

2.3 ISSUES CONSIDERED IN DETAIL IN CHAPTER 4

Issues were identified based on an awareness of concerns previously expressed by representatives from various environmental and industry organizations, the general public, and other agencies. Some were used to prepare the detailed impact analyses of the Alternatives in Chapter 4. The issues were also used to identify mitigation measures and to develop SOP's for reducing or eliminating the likelihood of adverse environmental effects from implementation of the proposed action. Some issues, however, did not receive detailed analysis because WS' human/wolf conflict management would not have any adverse effect on the legal, social or economic environment. The following issues were determined to be relevant based on public and other agency comments, and are analyzed in detail in Chapter 4:

- Effects on the wolf population in Idaho
- Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates
- Effects on public and pet health and safety
- Animal welfare and humanness of methods to be used
- Impacts to stakeholders, including aesthetics of wildlife

2.3.1 Effects on the wolf population in Idaho

Gray wolves found in Idaho have been removed from the Federal list of T/E species and are classified by Idaho's authority¹³ and are currently managed by the IDFG. In 2002 the Idaho Legislative Wolf Oversight Committee developed the Idaho Wolf Conservation and Management Plan, which was accepted and passed by the Idaho Legislature (ILWOC 2002). The Legislature, in a good faith effort to ensure ESA recovery, increased Idaho's minimum wolf population as directed in the Federal Plan from 100 individuals and 10 breeding pairs to 150 individuals and 15 breeding pairs. In 2008 the Idaho Fish and Game Commission adopted the Idaho Wolf Population Management Plan (IDFG 2008a). The purpose of the plan is to insure a viable gray wolf population, provide for public harvest, reduce conflict, and provide a flexible, adaptive process for the management of wolf populations during the 5-year period following de-listing. The IDFG (2008a) Plan is designed to ensure that wolf populations are maintained at the 2005 population level (about 500 wolves, more than 5 times the minimum Federal recovery level) or higher. With a regulated wolf hunting season and other management actions, the minimum statewide wolf population estimate at the end of 2009 was 835, close to the minimum population estimate of 850 wolves at the end of 2008 (Mack et al. 2010). Concerns that wolf damage management activities might result in the reduction of local populations of wolves or have a cumulative adverse effect on the viability of the Idaho wolf population will be addressed in detail in Chapter 4.

2.3.2 Effectiveness of nonlethal and lethal control efforts in reducing wolf predation on livestock and/or wild ungulates

Some critics of wolf damage management and Idaho's regulated wolf harvest have suggested that lethal control of wolves is unnecessary because they believe nonlethal methods can effectively prevent wolf depredations on livestock, and that lethal removal of wolves may actually exacerbate conflicts between wolves and livestock. Conversely, proponents of wolf damage management and wolf harvest believe both of these activities can be effective in helping to reduce the level of wolf/livestock conflicts and the impact of wolves on big game herds.

Idaho WS, at the direction of the IDFG, applies an integrated wildlife damage management approach where the integration and application of all approved methods of prevention and management, both nonlethal and lethal, are considered in solving predation problems. The evaluation, selection and eventual application of methods considers the: 1) overall effectiveness of the method and its ability to resolve the problem, 2) specific type and magnitude of damage, 3) geographic extent, 4) duration, frequency and likelihood of recurring damage, 5) nontarget species vulnerability, 6) environmental condition and impacts, 7) social and legal factors, and 8) relative costs.

Effective wolf conservation might be enhanced by timely application of prevention techniques that reduce the likelihood of depredations (Ciucci and Boitani 1998, Fourli 1999, Bangs and Shivik 2001). In addition, enhanced understanding of periodic trends, if present, might allow for improved planning, management, and mitigation of conflicts due to wolf depredation. In particular, availability and accessibility to wolves of adult livestock and of calves during calving often follows a seasonal pattern with annual reoccurrence. In fact, some previous studies portrayed increases in wolf depredation during different spring or summer months corresponding to intensive grazing months for various livestock species (Dorrance 1982, Gunson 1983, Fritts et al. 1992, Mack et al. 1992). Analysis regarding effectiveness of both nonlethal and lethal methods in addressing wolf depredations will be discussed in detail in Chapter 4.

¹³ Wolves are classified as a big game animal under Idaho Administrative Code (IDAPA 13.01.06).

2.3.3 Effects on public safety and pet health and safety

One aspect of wolf damage management actions is their ability to reduce risks to public safety and domestic animals from wolf predation. At the same time, it is important to consider potential risks to public safety and domestic animal safety from methods used in conducting wolf damage management activities. In particular, there may be concerns that the mechanical methods used for wolf capture and/or removal (*i.e.*, trapping, snaring, aerial shooting) may be hazardous to people and pets. Other individuals may be concerned that continued increases in wolf populations might threaten livestock and public and pet health or safety. Procedures for addressing risks to human health and safety from wolves are outlined in Idaho's Wolf Conservation and Management Plan (ILWOC 2002) and Idaho Wolf Population Management Plan 2008-2012 (IDFG 2008a).

Firearm use is a very sensitive issue because of concerns relating to public safety and firearms misuse. To ensure safe use and awareness of firearms issues, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). WS personnel who use firearms as a condition of employment are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

2.3.4 Animal welfare and humaneness of the methods to be used

The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Kellert and Berry (1980) in a survey of American attitudes toward animals stated that 58% of their respondents, ". . . care more about the suffering of individual animals . . . than they do about species population levels." Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns, if ". . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process." Suffering has been described as a ". . . highly unpleasant emotional response usually associated with pain and distress." However, suffering ". . . can occur without pain . . .," and ". . . pain can occur without suffering . . ." (American Veterinary Medical Association (AVMA) 2001). Because suffering carries with it the implication of a time frame, a case could be made for ". . . little or no suffering where death comes immediately . . ." (California Department of Fish and Game (CDFG) 2004), as in the case of shooting or drug-induced euthanasia. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The issue of humaneness has at least two aspects in relation to the proposed action.

1. Animal welfare organizations are concerned that some methods used to manage wildlife damage expose animals to unnecessary pain and suffering. Research suggests that with some methods, such as restraint in foothold traps, changes in the blood chemistry of trapped animals indicate "stress." Blood measurements indicated similar changes in foxes that had been chased by dogs for about 5 minutes as those restrained in traps (USDA 1994). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.
2. Humaneness, as perceived by the livestock industry and pet owners, requires that domestic animals be protected from predators because humans have bred much of the natural defense capabilities out of domestic animals. It has been argued that man has a moral obligation to protect these animals from predators (USDA 1994). Predators frequently do not kill larger prey animals quickly, and will often begin feeding on them while they are alive and still conscious (Wade and Bowns 1982).

The decision making process involves tradeoffs between the aforementioned aspects of pain from damage management activities and the needs of humans to reduce wildlife damage. An objective analysis of this issue must consider not only the welfare of a wild animal caught in a foothold trap, but also the welfare of the domestic animals and wild prey that may continue to be maimed and killed if the foothold trap or other control tools were not being used. The challenge in coping with this issue is how to achieve the least amount of animal suffering with the constraints imposed by current technology, funding, and a limited workforce.

WS personnel are trained professionals who strive to use the most humane methods available to them, recognizing the constraints of current technology, workforce, funding and social concerns. In determining the most appropriate damage management strategy, preference is given to practical and effective methods, both nonlethal and lethal. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could be a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

WS has improved the selectivity and humaneness of many management devices through research and is striving to bring new, more humane tools and methods into use. WS, through the combined efforts of the WS state programs and the USDA, APHIS, WS, National Wildlife Research Center (NWRC), has been involved in the testing and development of a number of nonlethal wolf damage management techniques including fladry, pyrotechnics, livestock guarding animals, radio activated guard (RAG) electronic frightening devices, and other light-siren devices. Whenever possible and practical, WS employs euthanasia methods recommended by the AVMA (2001) or the recommendations of a veterinarian, even though the AVMA euthanasia methods were developed principally for companion animals and slaughter of food animals, and not for free-ranging wildlife.

2.3.5 Impacts to stakeholders, including aesthetics of wildlife

2.3.5.1 Variations in perception of wildlife damage

During the last 200 years, broad-scale changes in land-use patterns (*e.g.*, housing developments, agriculture, roads, industrial complexes, etc.) have occurred as the increasing human population settled North America. Notable is the large-scale conversion of natural landscapes to agricultural and urban environments. As humans encroach on wild habitats, they compete with wildlife for space and other resources, which increases the potential for conflicts. Concurrent with this growth and change is a desire by some segments of the public to completely protect all wildlife, which can create localized conflicts with resource managers and owners experiencing problems with some species. USDA (1994) summarizes the American perspective of the relationship between wildlife values and wildlife damage, as follows:

"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife is generally regarded as providing economic, recreational and aesthetic benefits . . . and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and value is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well."

Biological carrying capacity is the limit of the land or habitat to support healthy populations of species without long-term degradation of either the health of the species or the associated environment (Decker and Purdy 1988). The wildlife acceptance capacity (also known as cultural carrying capacity) is the limit of human tolerance for wildlife, or the maximum number of a given species that can coexist compatibly with local human populations (Decker and Purdy 1988). These capacities are especially important in areas inhabited by humans because they define the sensitivity of a local community to a specific wildlife species/problem. For any given situation involving a wildlife conflict, individuals directly or indirectly affected by the damage will have varying degrees of tolerance for the damage and the species involved in the damage. This tolerance determines the “wildlife acceptance capacity,” which is often lower than the “biological carrying capacity.” For example, the biological carrying capacity of gray wolves in Idaho could be higher than their current population; however, for some individuals and groups, the area has as many or more wolves than can be tolerated (*i.e.*, for these individuals, the wildlife acceptance capacity has been reached or exceeded). Once the wildlife acceptance capacity of a species is reached or exceeded, humans will demand implementation of programs, both lethal and nonlethal, to reduce damage or threats of damage.

The human attraction to animals has been well documented throughout history, an idea supported by prehistoric cave paintings and the domestication of wild animals. Today’s American public is no exception, as evidenced by the large percentage of households that have pets or observe wildlife. Some people also may consider individual wild mammals and birds as “pets” and exhibit affection toward these animals. They may also want to have more wild animals in their immediate environment. Some people feel a spiritual bond with wild animals. Conversely, some people have no emotional attachment to wildlife; some may even fear the presence of wild animals in their vicinity and demand their immediate removal.

Ideas about how these programs are implemented and conducted are as unique as the almost infinite combinations of philosophies, psyches, aesthetic values, personal attitudes, and opinions found in humans. These differences of opinion result in concerns that the proposed action or the Alternatives would result in the loss of aesthetic or cultural/spiritual benefits to the general public and resource owners.

2.3.5.2 Aesthetic and sociological values of wildlife

Wildlife generally is regarded as a source of economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective, dependent on what an observer regards as beautiful. Wildlife populations also provide a range of direct and indirect social and economic benefits (Decker and Goff 1987). Direct benefits are derived from a user’s personal relationship or direct contact with wildlife and may include either consumptive (*e.g.*, using or intending to use the animal such as in hunting or fishing) or non-consumptive use (*e.g.*, observing or photographing animals) (Decker and Goff 1987). Indirect benefits, or indirect exercised values, arise without a human being in direct contact with an animal and are derived from experiences such as looking at pictures or videos of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Two forms of indirect benefits exist according to Decker and Goff (1987): bequest and pure existence. Bequest benefits arise from the belief that wildlife should exist for future generations to enjoy; pure existence benefits accrue from the knowledge that the animals exist in the human environment (Decker and Goff 1987) or that they contribute to the stability of natural ecosystems (Bishop 1987).

Some people directly affected by problems caused by wolves insist on the lethal removal of the problem animal(s) from the area where the conflict occurs. Others have the view that all wildlife involved in conflicts should be captured and relocated to another area to alleviate the problem. Individuals not directly affected by a conflict may be supportive of affected humans, neutral, or totally opposed to any removal of wildlife from specific locations or sites.

Those who oppose removal of wildlife may do so because of emotional or spiritual ties to the animals, which are similar to the bonds that may exist between a human and a pet. Some may totally oppose wolf damage management, especially if lethal methods are used, and want WS and the IDFG to teach tolerance of wolves causing conflicts. These individuals generally believe that individual animals have inherent value and should not be killed to meet the desires of man-kind. They may also feel that individual animals have rights similar to those of humans and that, if it is inappropriate to treat a human in a given manner, then it is also inappropriate to treat an animal in that manner.

The goal of wolf damage management is to provide relief from damage or threats of damage while minimizing the potential for negative impacts on the environment including aesthetic and social values. WS would only conduct wolf damage management in consultation with IDFG and/or the Nez Perce Tribe, as appropriate and after a request has been received from citizens, organizations, and others who are experiencing problems (*i.e.*, where a need exists).

2.4 ISSUES NOT CONSIDERED IN DETAIL AND RATIONALE

2.4.1 What is the rationale for suggesting that lethal wolf damage management is needed to help minimize negative attitudes toward wolves and reduce the likelihood of illegal wolf killings?

The IDFG is aware that illegal wolf killing occurs in the Idaho wolf population and discusses the impact of illegal killing on the wolf population in IDFG (2008a). IDFG and WS realize that a small portion of the human population will likely kill wolves no matter what wolf damage management program is in place. However, the agencies also believe that prompt, professional, effective resolution of conflicts with wolves will help maintain public tolerance of wolves and allow for maintenance of a recovered population, will prevent an increase in untrained individuals attempting wolf damage management on their own, and should reduce the likelihood of an increase in anti-wolf behaviors by intolerant stakeholders (Niemeyer et al. 1994, USFWS 1994). Illegal killing generally occurs when people feel they have no legal access to resolution of their problems.

Most people would rather take advantage of an effective legal wolf damage management program than take illegal action and suffer the consequences of legal prosecution. From reintroduction (1995) until 2007, 68 wolves were known to be unlawfully taken in Idaho (IDFG 2008a). Based on estimates calculated using radio-collared wolves, illegal take accounted for approximately 7% of annual wolf mortality in Idaho since reintroduction (IDFG 2008a). The agencies believe that an integrated wolf damage management program which includes access to lethal methods would be the most effective in resolving conflicts with wolves. Social studies by Kellert (1999), Schanning et al. (2003), Naughton-Treves et al. (2003), and Naughton et al. (2005) in the Great Lakes area show strong public support for lethal control of problem wolves by government agents. Illegal killing by private individuals are less likely to be specific, and could potentially have more adverse impacts on the wolf population than focused lethal actions by trained agency professionals. Illegal killing by untrained individuals is also less likely to be effective in reducing depredation events, as it would be less likely to target the specific depredating animals. Federal and State law enforcement personnel strive to prevent illegal killing of wolves, but the remote nature of much of the areas inhabited by wolves in Idaho makes it difficult to protect wolves from illegal actions. Idaho conservation officers either assisted USFWS or

were primary investigators for most wolf cases since 2005. Unlawful take of listed wolves is a misdemeanor violation under Section 9 of the ESA and Federal courts have levied a variety of civil and criminal penalties for unlawful take. However, wolves are classified as a big game animal under Idaho Administrative Code (IDAPA 13.01.06). Under state law (Idaho Code §36-1101(a)), a violation of wolf harvest regulations or illegal take of a wolf could result in a misdemeanor fine of \$25-\$1,000. Multiple violations may be considered flagrant and/or felonious and result in higher fines and penalties including jail time, loss of hunting privileges, and forfeiture of equipment used in the crime.

The Wildlife Society, an international organization of professional wildlife biologists, states that “Control of wolves preying on livestock and pets is imperative and should be prompt and efficient if illegal killing is to be prevented and human tolerance of the presence of wolves is to be maintained (Peek et al. 1991, 73 FR 10514, February 27, 2008, 74 FR 15123, April 2, 2009). The International Union of Nature and Natural Resources or World Conservation Union (IUCN) has established a “Manifesto on Wolf Conservation.” The “Manifesto” was published in International Wolf Magazine in 1994 (IUCN 1994). The 7th Principle for wolf conservation stated, “It is recognized that occasionally there may be a scientific established need to reduce non-endangered wolf populations; further it may become scientifically established that in certain endangered wolf populations specific individuals must be removed by appropriate conservation authority for the benefit of the wolf population.” In an extensive literature review of strategies for reducing carnivore/livestock conflict by Norwegian biologists, it was concluded that lethal control should be considered on endangered carnivores such as wolves to prevent expansion into areas of high conflict (Linnell et al. 1996).

2.4.2 What about the possibility that wolf removal, whether through control actions or hunting, could disrupt a pack’s social structure, thereby leading to an increased likelihood of conflicts?

As indicated in Figure 1-1 in Chapter 1, as the number of wolf packs in Idaho has increased, the number of incidents of confirmed predation on livestock has likewise increased. The data in Figure 1-1 would also appear to suggest that if the number of wolf packs in Idaho could be reduced, the result would likely be a reduction in, rather than an increase in wolf predation on livestock (USDA 2010).

From a conflict management perspective, Bradley (2004) found that after partial or complete wolf pack removal, depredations usually ceased for the remainder of the given grazing season. However, most packs that were partially removed (68%) depredated again within the year. Where entire packs were removed, the rate of recolonization was high (70%) and most recolonizations (86%) occurred within a year of removal of the previous pack; most packs (86%) that recolonized were implicated in depredations. Packs in which breeders were removed were no less likely to cause depredations again within the year than packs with non-breeders removed.

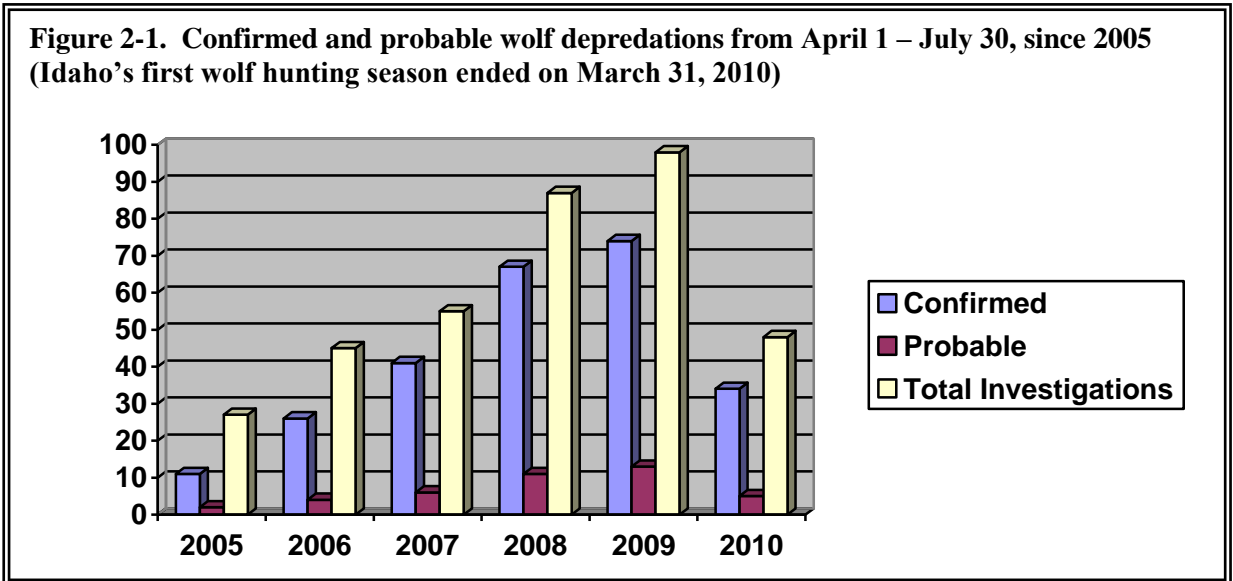
Pack resilience to mortality is inherent in wolf behavioral adaptation and reproductive capabilities (Brainerd et al. 2008). Wolf populations have sustained human-caused mortality rates of 30 to 50% without experiencing declines in abundance (Keith 1983, Fuller et al. 2003). Based on mean pack size of 8, mean litter size of 5, and 38% pups in packs, Boertje and Stephenson (1992) suggested 42% of juveniles and 36% of adults must be removed annually to achieve population stability. Mech (1970) suggests that more than 50% of wolves older than 5-10 months must be killed to “control” the wolf population; other researchers have indicated declines may occur with human-caused mortality at 40% or less of fall wolf populations (Ballard et al. 1997, Peterson et al. 1984) (See Chapter 4, Section 4.4.1.1 for more discussion of wolf mortality effects). In addition, Brainerd et al. (2008) found that 62% of packs in recovering populations retained territories despite breeder loss, and of those who lost territories, one-half became re-established. Furthermore, pup survival was primarily dependent on size of pack and age of pup because multiple pack members feed pups despite loss of a breeder. Pup survival in 84% of packs with breeder loss was similar or higher than packs without breeder loss

(Mech and Boitani 2003). Brainerd et al. (2008) stated that breeder replacement was highest and fastest in populations with more than 75 wolves, as is the case in Idaho.

MacNulty et al. (2009a, 2009b) discussed evidence from observations of Yellowstone wolves suggesting that as wolves age, their ability to kill elk declined due to physiological deterioration, similar to the decline in abilities of human athletes as they age. The authors' data suggested that 2-3 year old wolves were in the best physical condition to attack and kill prey, and the higher the proportion of wolves over age 3 in the population, the lower the rate at which they kill elk. Although data are lacking on this subject, it may be possible that if wolves are less able to kill elk or other natural prey as they age, they may be more likely to attack easier prey such as domestic livestock.

MacNulty et al (2009b) suggests that net predatory performance decreases with size when prey is substantially more difficult to pursue than handle (*i.e.*, wild ungulates vs livestock). And if poor locomotor performance narrows the range of potential prey to slower-moving species, this could conceivably put livestock more at risk from an aging or unharvested wolf population. Final data on the age class of wolves killed during Idaho's first wolf hunting season in 2009-2010 are not yet available, but age class data obtained from Montana's first wolf hunting season in 2009 indicates all age classes were fairly similarly distributed in the harvest (Sime et al. 2010).

Although it is probably too soon to draw any definitive conclusions about whether or not Idaho's first regulated wolf hunting season in 2009-2010 may have helped reduce the number of livestock depredation problems, the data in Figure 2-1 at least appear to suggest that possibility. Early indications are that the number of wolf depredations on livestock have been about half as many in the 4 months following the close of the wolf hunting season as compared to the same 4 months one year earlier. This is the first year since wolves were reintroduced into Idaho that depredations have decreased, rather than increased during this period.



2.4.3 What about the possibility that a reduction in Idaho's wolf population, through hunting and/or lethal depredation control measures, could affect other aspects of the environment, as has been demonstrated in Yellowstone National Park?

Researchers at YNP agree, at least qualitatively, that wolf restoration, as demonstrated through trophic cascades because of wolf predation or threats of predation, changed prey behavior, interspecies

relationships, and habitat use (Schmitz et al. 1997). Wolves have had an indirect effect on plant life because of wolf-caused changes to herbivore density (e.g., elk reduced their use of riparian areas and moved to higher areas because of wolf predation or threats of predation) (Mao et al. 2005, Beyer 2006, Ripple and Beschta 2006). The presence of wolves in YNP apparently positively affects willow growth (Beyer 2006, Ripple and Beschta 2004). Fortin et al. (2005) also found elk less likely to travel into aspen stands when wolves were present; while wolves were present elk travelled more frequently into conifer forests. Creel and Winnie (2005) found elk reduced herd size far from cover on days when wolves were present but were in larger groups the days wolves were absent. Creel and Winnie (2005) showed that in the presence of wolves, elk retreated into forest cover whereas when wolves were absent elk foraged in the open grassland. Gude et al. (2006) found that in the Madison River valley, elk responded to wolf presence by moving away from wolves, reducing elk effects on vegetation. As a result, taller vegetation benefits a variety of biota, including songbirds (Baker and Hill 2003). Preliminary results show willows had a greater abundance and diversity of songbirds than did suppressed willow stands (Hansen et al. 2005).

Similar results were also observed from elk-willow studies by investigators on the effects of elk herbivory on aspen. One study found taller aspen suckers in aspen stands with high wolf but low elk use (Ripple et al. 2001), but this result did not translate to aspen recruitment (M. Kauffman, unpublished data as cited in Hebblewhite and Smith 2005). Other work found increased cottonwood germination, but similarly low sapling recruitment (Beschta 2003). Importantly, all researchers show that the response was non-uniform suggesting that vegetative responses are linked to variation in wolf predation risk (Ripple and Beschta 2006). Restoration of willow will likely affect other animals and plants as well. Fishes, reptiles, amphibians, and small mammals have all been shown to benefit from wetland restoration (Hebblewhite and Smith 2005).

One example of wolf effects in YNP has been reduction of the coyote population by wolf predation (Crabtree and Sheldon 1999). Most of the reduction was from direct killing at wolf kills when coyotes attempted to scavenge on carcasses (Crabtree and Sheldon 1999, Ballard et al. 2003). Recently, however, coyotes have adapted to wolves through changes in use of the landscape and socially by living in smaller groups (J. Sheldon, unpublished data as cited in Hebblewhite and Smith 2005). The pre-wolf number of coyote packs in Lamar Valley was 11, after wolves were released it declined to 6, but has recently increased to 12 (R. L. Crabtree and J. Sheldon, pers. comm. as cited in Hebblewhite and Smith 2005). Further, there is evidence for competition between wolves and mountain lions where wolves are generally dominant over mountain lions¹⁴ (Ruth 2004). While mountain lions and wolves in YNP use prey and habitat differently, reductions in use of space by mountain lions has occurred since wolves were reintroduced (Ruth 2004). Competition between wolves and mountain lions appears to be minimal as mountain lion prey selection and kill rates have not changed compared with pre-wolf monitoring (Murphy 1998, Ruth 2004). However, in another 10 years post-wolf in YNP, based on studies in Banff National Park (Kortello et al. 2007), Hebblewhite and Smith (2005) predict competition between wolves and mountain lions will increase to a degree that could reduce mountain lion abundance, and should prey continue to decline and become more limiting, future competition for prey cannot be ruled out.

Twelve different scavengers have been recorded using wolf kills in YNP (Wilmers et al. 2003) and five visit virtually every kill: coyotes, ravens, magpies, and golden and bald eagles. Spatially and temporally wolf-killed carrion is more available to scavengers post-wolf recovery¹⁵. However, if

¹⁴ Although wolves have clearly been the largest change to the carnivore community in the last 10 years in YNP, both grizzly bear and mountain lion densities have also been higher in the last 10 years.

¹⁵ No other species generates as much carrion over such a consistent temporal scale as wolves (Wilmers et al. 2003).

wolves reduce elk numbers, less total carrion might be available, but carrion more evenly distributed might compensate for any negative effect of reduced carrion biomass.

Besides avian scavengers, many mammals also scavenge wolf kills. Black bears are subordinate to wolves at carcasses (Ballard et al. 2003), although lone wolves or young wolves can be at a disadvantage to large black bears. Grizzly bears benefit from wolf-killed prey throughout the year, whereas prior to wolf restoration, carrion was primarily only available in late winter. Carcasses may also be important to bears during fall when other food sources fail or are scarce (like the availability of whitebark pine nuts; grizzly bear use of wolf-killed ungulate carcasses increased during poor whitebark pine nut years). This illustrates an indirect effect between grizzly bears and whitebark pine as influenced by wolves.

There are other scavengers besides vertebrates, and also indirect effects of wolf predation on flora and soil nutrients. Research is just beginning on this topic, but more species of beetles use carcasses than all vertebrates put together. Sikes (1994) found 23,365 beetles of 445 species in two field seasons examining wolf-killed carrion. Obviously, this underestimates the number of decomposers such as insects, mites, invertebrates, bacteria, and fungi, which likely number in the thousands (Hebblewhite and Smith 2005). In addition, even longer-term effects of carcasses are the localized nutrients they deposit. Bump and Peterson (pers. comm. as cited in Hebblewhite and Smith 2005) found elevated levels of nutrients around elk carcasses. Using soil samples, one at the carcass site and one away from it, they found 20–500% greater nitrogen (ammonium and nitrate), phosphorous, and potassium at the carcass. Bump and Peterson attribute this to direct nutrient leaching from carcasses and indirectly to urine and feces from carnivores and scavengers.

Another area of potential indirect effect includes predation on prey exposed to diseases such as Brucellosis (*Brucella* spp.). While empirical evidence for this is scarce, Hebblewhite and Smith (2005) believe it is reasonable to expect that density-dependent disease prevalence in ungulates may be reduced by wolf predation (Packer et al. 2003), although in some instances, predation may actually increase disease prevalence (Holt and Roy 2007).

In conclusion, there is evidence for direct and indirect effects of wolves in YNP (Hebblewhite and Smith 2005). Direct effects include limitation or regulation of elk by wolves, behavioral avoidance of wolves by elk, and competition with other carnivores. Indirect effects include the influence of wolves on willow and aspen growth, species that rely on these plants such as songbirds and beaver, and apparent competition between elk and alternate prey such as bison, moose, and caribou. It is also clear that the most numerous indirect interactions occur between wolves and scavengers. Between 12 and 20 vertebrate scavengers made use of wolf-killed prey, a small number compared to the 445 species of beetle scavengers. However, regardless of the prevalence of indirect effects, the dominant interaction that exists in YNP is between wolves and elk. Elk reduced group sizes and moved into forested cover in the presence of wolves, changed habitat selection to avoid wolves in summer, and avoided aspen stands with higher predation risk (*i.e.*, anti-predatory behavior).

Wolves have likely been influencing elk behavior in Idaho similar to what has been documented in Yellowstone, and would be expected to continue doing so under all of the Alternatives being considered in this EA, because IDFG intends to continue managing Idaho's wolf population in a sustainable manner (IDFG 2008a).

2.4.4 Effects on non-target species populations, including State and Federally listed Threatened or Endangered (T/E) species

The only species for which an average of more than one individual per year are taken unintentionally

during Idaho WS wolf control efforts are coyotes and red fox (Table 2-1). Both of these canid species are abundant in Idaho, and they occur to varying degrees in many of the same areas where wolves occur. They are never unintentionally taken by shooting, but both of these species are attracted to the same types of baits and lures used to attract wolves to trap sets, and most unintentional take of coyotes and red foxes occurs when trapping for wolves. The use of pan-tension devices on foothold traps set for wolves helps reduce the number of unintentional captures, but does not eliminate all unintentional captures. Some of the unintentionally captured coyotes and red foxes taken during wolf trapping efforts are released, but in other cases, they are euthanized because they present potential predation threats to other resources in the area, particularly where sheep and lambs are being grazed.

Idaho's coyote population has been conservatively estimated at 50,000 (USDA 1996, 2002), and Connolly (1995) suggests that coyote populations can withstand annual harvest levels of 70% and still maintain a viable population. The total estimated statewide average annual take of coyotes during the 3-year 2007-2009 period has been less than 10,000 individuals, or less than 20 % of the estimated statewide population, and well below the sustainable harvest level. Idaho's red fox population has been conservatively estimated at about 22,000 (USDA 1996, 2002), and similar to coyotes, red fox can compensate for up to a 70% annual harvest level (USDA 1994). The total estimated statewide average annual take of red fox during the 3-year 2007-2009 period has been about 2,275 individuals, or only about 10% of the estimated statewide population, also well below the sustainable harvest level. There is essentially no measurable impact on Idaho's coyote or red fox populations related to WS wolf damage management efforts, and the cumulative impacts are of a very low magnitude.

Table 2-1. Cumulative Impact on Species Unintentionally Taken¹ by Idaho WS During Wolf Damage Control Operations, FY 2007 – FY 2009

SPECIES KILLED WHILE TARGETING WOLVES	ESTIMATED STATEWIDE POPULATION ²	STATEWIDE POPULATION TREND ²	3-YEAR AVERAGE WS UNINTENTIONAL TAKE IN TRAPS AND SNARES (WHILE WOLF TRAPPING)	3-YEAR AVERAGE OTHER KNOWN and ESTIMATED TAKE ³	WS UNINTENTIONAL TAKE (Estimated % of Population)	CUM. TAKE ⁴ (Estimated % of Population)	ALLOWABLE HARVEST LEVEL
Coyote	50,100	Stable	37	9,855	0.07%	19.8%	70%
Red Fox	22,000	Stable to Declining	13	2,262	0.06%	10.3%	70%

¹ Only includes species for which the average yearly take by WS was more than 1 individual.

² Based on information provided in USDA (2002) and IDFG (C. White, pers. comm. 2010).

³ Includes 3-year average number of animals taken by WS through wildlife damage management activities by FY (MIS 2007, 2008 and 2009) (3-year average: coyotes n=4451, red foxes n=102; coyotes and foxes reported statewide harvest by licensed trappers for the 2006-2007 (IDFG 2007a), 2007-2008 (IDFG 2008b) and 2008-2009 (IDFG 2009c) seasons (3-year average: n=2,620 coyotes and n=1080 red foxes); and coyotes reported taken through private aerial shooting activities during calendar year 2007 (ISADCB 2007), 2008 (ISADCB 2008) and 2009 (ISADCB 2009) (3-year average: n=164 coyotes). Additional coyotes and red foxes are undoubtedly taken by licensed hunters and shooters, pest and nuisance control operators, and private citizens who practice their own predator control. To account for these animals, WS will assume that those numbers equal those taken by licensed trappers (3-year average n=2,620 coyotes and n=1,080 red foxes).

⁴ Cumulative take impacts are the effects on a species' population from all known causes.

Previously prepared Biological Assessments have determined that the grizzly bear and the Canada lynx are the only federally listed T/E species which might potentially be affected by WS wolf damage management activities. The USFWS has concurred that WS' wolf damage management methods are not likely to adversely affect grizzly bears in Idaho, and are not likely to jeopardize the continued existence of Canada lynx (USDI 1992, 1996, 2002). Although the possibility exists that a grizzly bear or Canada lynx could unintentionally be captured in traps or snares set for wolves, WS employees

comply with USFWS prescribed reasonable and prudent measures and terms and conditions to reduce the likelihood of any unintentional captures of these species, and no lynx or grizzly bears have been unintentionally captured during wolf damage management efforts in the 15 years that WS has been involved in these efforts. WS has determined that neither the current program nor the proposed action are likely to have any negative effects on any other State or federally listed species.

2.4.5 Lethal removal of wolves during the spring and early summer months could potentially result in litters of wolf pups becoming orphaned.

Depending on the circumstances, lethal removal of wolves to address livestock depredation problems or to address wolf impacts on ungulate populations may involve removing most or all members of a specific wolf pack. If these types of removals occur during the spring or early summer months, and the decision has been made to remove the entire pack, concerted efforts are made to remove all of the pups as well as the adults, in order to avoid orphaning the pups. When not all adult wolves are removed from a pack, a remaining wolf or wolves may continue to feed and care for the remaining pups (Packard 2003, Boyd and Jimenez 1994). There may be occasional circumstances however, where in spite of concerted efforts to humanely remove any pups left after all adult wolves have been removed, one or more pups may be left without any adult wolves to feed or care for them. The only way to avoid this circumstance altogether would be to limit wolf removal efforts during this time frame, so as to always ensure that at least one or more adult wolves were left to care for any pups. In some circumstances, this would be inconsistent with the objective of stopping chronic wolf predation on livestock.

In the case of wolf removals to protect ungulates, much of this effort may most logically occur during the spring months, after the wolf population in the treatment area had already been reduced to a seasonal low through public hunting (if that option exists) and/or natural mortality. Agency wolf removal efforts at this time would be expected to have the maximum additive effect in reducing the local wolf population, which may be necessary in order to achieve the desired level of removal. As in the case with wolf removals to protect livestock, concerted efforts would be made to remove pups and ensure that no wolf pups were left to fend for themselves.

Unfortunately, there could be occasional instances where dependent young may be orphaned during wolf damage management activities. To keep things in perspective, it is important to consider the amount of suffering and death that occurs in the absence of predator removal as well. Predators by definition kill and eat prey, which does not ordinarily represent a problem unless this behavior conflicts with human interests. But regardless of whether predation creates conflicts with human interests, prey species are typically subjected to pain and suffering when preyed upon by predators. Death in nature is notoriously harsh (Howard 1986), and it would be purely speculative to infer whether the fate of any potentially orphaned wolf pups would be any more or less harsh if their parents had not been killed through predator control activities. To the extent that predator control removes animals that would otherwise continue to kill or injure prey animals, the overall level of pain and suffering may be reduced.

2.4.6 Appropriateness of preparing an EA (rather than an EIS) for such a large area, rather than preparing multiple EAs for smaller, more site-specific areas

Federal agencies have the discretion to determine the geographic scope of their NEPA analyses [*Kleppe v. Sierra Club*, 427 U.S. 390, 414 (1976)] and WS has determined that preparation of this EA to address wolf damage management statewide in Idaho is appropriate and consistent with IDFG wolf management objectives and plan (IDFG 2008a). USFWS (2008) prepared a single EA to collectively address specific aspects of wolf damage management in the three Northern Rockies wolf states (*i.e.*, Idaho, Montana and Wyoming), whereas this EA only covers one state. If in fact a determination is

made through this EA that the proposed action would have a significant impact on the quality of the human environment, then an EIS may be prepared in compliance with NEPA. In terms of considering cumulative impacts, one EA covering the entire state of Idaho may provide a better analysis than multiple EA's covering smaller zones within the state. A more detailed and site-specific level of analysis would not likely contribute to substantial improvement in the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995).

2.4.7 Concerns that the Proposed Action may be highly controversial and its effects may be highly uncertain, both of which would require that an EIS be prepared.

The failure of any particular special interest group to agree with every act of a Federal agency does not necessarily create a controversy, and NEPA does not require the courts to resolve disagreements among various scientists as to the methodology used by an agency to carry out its mission [Marsh v. Oregon Natural Resource Council, 490 U.S. 360, 378 (1989)]. As was noted in the FONSI associated with USDA's (2002) predator damage management EA: "The effects on the quality of the human environment are not highly controversial. Although there is some opposition to predator control, this action is not highly controversial in terms of size, nature, or effect." If in fact a determination is made through this EA that the proposed action would have a significant effect on the quality of the human environment, then an EIS would be prepared.

2.4.8 If lethal control is implemented, effort must be taken to target the individual wolf or wolves responsible for the depredation.

WS personnel are highly trained in methods of identifying wolf depredations, and use sound scientific information for assessing depredation events (Acorn and Dorrance 1990). Agency personnel strive to target the specific wolves involved in depredation to stop the problem as quickly as possible and to reduce control and damage costs, but like any wildlife management action in an uncontrolled situation, cannot guarantee that the wolf taken is always the specific individual involved in the depredation. Identification of depredating individuals is complicated by pack hunting behavior. In instances when a pack is involved in a depredation incident, multiple individuals may have been involved in the depredation event and agency personnel cannot always determine which specific individuals were responsible. Measures used to identify and target depredating wolves include, but are not limited to, careful analysis of wolf sign at the site by trained professionals, review of information on radio-collared wolves in the vicinity of the depredation, and focusing wolf capture efforts in areas near the depredation site. Sign at the depredation site can often be used to determine if the depredation was caused by an individual wolf or multiple wolves. Because wolves are very territorial, the wolf or wolves responsible for the depredation are the ones most likely to return to the depredation site, and traps set near the kill site are most likely to capture the wolf or wolves involved in the depredation. When radio-collared individual wolves or packs are implicated in depredations on livestock (by proximity in time and space to the depredation), telemetry monitoring can be used to help target those wolves either through trapping efforts on the ground or by aerial shooting.

2.4.9 Producers should not expect to prevent all predation losses and some losses are a cost of doing business.

The agencies do not expect to prevent all losses, nor are they proposing lethal wolf damage management as a solution to all depredation incidents. WS and the IDFG use an integrated approach to resolve wolf damage complaints. In some situations the use of nonlethal methods alone may be adequate for resolving wolf depredation complaints, but there will likely always be some situations which require lethal measures. Most instances of wolf predation on sheep, for example, occur in spite of sheep producers' use of herders and livestock guarding dogs to help protect the sheep from

predation. The Defenders of Wildlife, a private wildlife and habitat conservation organization, has voluntarily been compensating Idaho livestock producers 100% of the value of livestock that are confirmed by WS as killed or injured by wolves and 50% of the value of livestock that are designated by WS as “probable” wolf predation. In addition, the Idaho Office of Species Conservation offers a pro-rated compensation program to livestock producers who have filed for compensation through the Defenders of Wildlife for “probable” wolf predation designations and for missing livestock that are presumed killed by wolves. Livestock producers are not ordinarily compensated for harassment of livestock by wolves, fence repairs after wolves chase livestock through fences, costs to gather and resort livestock dispersed by wolves or for the extra costs when producers have to pay for feed because livestock are removed from grazing pastures to minimize risks from wolves.

2.5 ADDITIONAL ISSUES NOT CONSIDERED BECAUSE THEY ARE OUTSIDE THE SCOPE OF THIS ANALYSIS

2.5.1 Circumstances under which livestock owners and other private citizens may legally take wolves

Following the initial issuance of the original (1994) 10j rules for management of the nonessential, experimental gray wolf population in the NRM, subsequent 10j rules (issued in 2005 & 2008) have allowed greater flexibility and more aggressive control actions to deal with gray wolf depredations on livestock and other domestic animals (USFWS 2008). Wolves are managed by the IDFG and Idaho State statutes (IDFG 2008a) and this issue is outside the scope of this EA

2.5.2 IDFG issuance of permits to landowners to take wolves

Wolves are managed by the IDFG and Idaho State statutes (IDFG 2008a) and the issuance of permits by the IDFG is a non-federal action outside the scope of this EA.

2.5.3 Desire for or opposition to a hunting season for wolves

Wolves are managed by the IDFG and Idaho State statutes (IDFG 2008a) and the implementation of a regulated hunting season is the sole responsibility of the State of Idaho and outside the scope of this EA.

2.5.4 Appropriateness of trying to limit the impacts of wolf predation on ungulates

Wolves and ungulates are managed by the IDFG and Idaho State statutes (IDFG 2008a) and balancing predator and prey populations is the responsibility of the IDFG. Under the provisions of the Idaho Wolf Conservation and Management Plan (ILWOC 2002), IDFG has an obligation to assure that wolves in increasing numbers do not adversely affect ungulate populations. This issue is outside the scope of this EA.

Should wolves be relisted, the issue of wolf management to address unacceptable adverse impacts on ungulates is under the purview of USFWS and its implementation of 10j rules and related NEPA analysis (USFWS 2008).

2.5.5 Appropriateness of livestock grazing on public lands

Regulating or authorizing livestock grazing on public lands is the responsibility of the respective public land management agencies. The authority and regulation of livestock grazing on public lands is outside of WS’ authority and outside the scope of this EA.

2.5.6 Appropriate population level for wolves in Idaho

IDFG and the Idaho Fish and Game Commission have management authority for wolves in Idaho, and they have determined that an appropriate population level for wolves in Idaho is 500-700 wolves (IDFG 2008a, IDFG 2009a). The USFWS established recovery standards for Idaho and other states in the Northern Rocky Mountain recovery area. The USFWS, through its approval of Idaho's Wolf Management and Conservation Plan (IDFG 2008a) and its wolf delisting decision, has concurred that this is an acceptable and appropriate population level, and this issue is outside the scope of this EA.

CHAPTER 3: ALTERNATIVES

3.1 INTRODUCTION

This Chapter consists of six parts: 1) an introduction, 2) a description of Alternatives considered and analyzed in detail, 3) a description of wildlife damage management strategies and methodologies, 4) wolf damage management methods that could be used or recommended by WS, 5) a description of alternatives considered, but eliminated from detailed analysis, and 6) a table of mitigation measures and standard operating procedures. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), “*Methods of Control*” (USDA 1994, Appendix J) and the “*Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program*” (USDA 1994, Appendix P), and information provided by the public. Four Alternatives were recognized, developed and analyzed in detail; and 7 alternatives were considered but not analyzed in detail, with supporting rationale presented.

IDFG has management authority for wolves found within Idaho and policies and procedures for wolf management within the state have been established (IDFG 2008a). WS acts as an agent for IDFG in conducting wolf damage management activities (IDFG and ISADCB 2006), but in the absence of WS involvement, IDFG would be responsible for conducting wolf damage management. The purpose of this EA is to examine the environmental impacts of various levels of WS involvement in Idaho wolf management.

3.2 DESCRIPTION OF THE ALTERNATIVES ANALYZED IN DETAIL

Under the first three Alternatives, WS wolf damage management assistance could be provided on private or public property and tribal lands when: 1) resource owners/managers request assistance to alleviate wolf damage, 2) wolf damage or threats are verified, and 3) agreements or work plans have been completed specifying the details of the damage management action to be conducted. Before WS would conduct wolf damage management on tribal-owned lands, the Tribal Council or other governing board would need to provide specific authorization.

The types of verified wolf or wolf-dog hybrid conflicts that could be addressed include: 1) depredation/injury of domestic animals, 2) harassment/threats to domestic animals, 3) property damage, and 4) injury and/or potential threats to human safety (e.g., habituated/bold/aggressive wolves). The Preferred Alternative would additionally allow for the WS program to provide assistance to IDFG to address the impacts of wolf predation on ungulates. All wolf damage management would be conducted in compliance with appropriate Federal, State and local laws and regulations and in cooperation and at the request of IDFG.

The environmental issues considered for each Alternative include impacts on the wolf population, impacts on non-target species including State and Federally listed threatened and endangered species, public and pet health and safety, humaneness and animal welfare aspects of the methods to be used, and sociological issues including the aesthetic and sociological values of wildlife.

For all Alternatives, IDFG retains its authority to implement or authorize nonlethal or lethal actions in addition to WS actions consistent with IDFG (2008a). For example, IDFG may issue permits to livestock producers or their agents who have experienced recent confirmed wolf predation on their animals or by authorizing IDFG staff or volunteers to remove wolves to address livestock depredations or to implement predation management plans for the benefit of ungulates. However, these decision-making processes are the responsibility of IDFG.

3.2.1 Alternative 1 - Continue the Current Wolf Damage Management Program (No Action)

This Alternative would continue the WS wolf damage management program as currently provided for under existing agreements and plans (IDFG and ISADCB 2006, ILWOC 2002, IDFG 2008a). If the legal status and classification of wolves in Idaho changes as a result of current or future litigation, then Alternative 1 would consist of similar wolf management activities to protect livestock and other domestic animals, but they would be conducted under the same 10j rules and other procedures and guidance in place prior to the delisting of wolves which occurred in May, 2009. The No Action Alternative serves as the baseline against which the impacts of management alternatives can be compared and can be defined as a continuation of current management practices (CEQ 1981).

Under Alternative 1, wolf damage management has been and would continue to be conducted on private and public lands¹⁶ in Idaho when the resource owners/managers request assistance to alleviate wolf damage, wolf damage is verified by WS, and an *Agreement for Control* or other work authorization documents have been completed. WS would provide technical assistance and operational wolf damage management using nonlethal and lethal management methods after applying the WS Decision Model (Slate et al. 1992). WS would be able to assist with wolf research, wolf monitoring¹⁷ and wolf or wolf-dog hybrid removal. Nonlethal methods used by landowners could include, but would not be limited to, changes in ranch management practices and pet care/supervision, proper carcass disposal, frightening devices, exclusion, guarding animals, habitat modification, and behavior modification of problem wolves. Nonlethal methods used operationally by WS may include foot-hold traps and snares with “stops” (used to live capture wolves for attaching radio-collars), frightening devices (*e.g.*, electronic guard, RAG) and aversive conditioning (*e.g.*, modified dog training collars) and nonlethal projectiles (*e.g.*, rubber bullets, bean bag rounds). Aversive conditioning and other experimental damage management techniques would only be used by WS after consultation and concurrence with IDFG.

In determining the most appropriate damage management strategy, preference would be given to nonlethal methods when they are deemed practical and effective (WS Directive 2.101). Lethal methods would be used to reduce damage after practical and appropriate nonlethal methods have been considered and determined to be ineffective or inappropriate to reduce damage to acceptable levels, or used and failed to reduce or stop the damage. In some instances, however, the most appropriate response to a wolf damage problem could involve concurrent use of a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy (*e.g.*, some instances of risk to human safety from bold wolves or situations where the landowner has already implemented practical and effective nonlethal methods prior to contacting WS and is still experiencing damage problems). Lethal methods could include shooting, calling and shooting, aerial shooting, and euthanasia of wolves live-captured in foot-hold traps, snares or other live-capture devices.

3.2.2 Alternative 2 – Expanded Wolf Damage Management Program (Proposed Action, Preferred Alternative)

Under the Proposed Action/Preferred Alternative, WS would be able to employ all the methods included under the Current Program for protection of domestic animals, but could additionally provide assistance to IDFG to protect ungulates in those situations where IDFG has determined that wolves are impacting the ungulate population in a specific management area.

¹⁶ WS could use lethal wolf damage management methods on public land to reduce depredation when coordinated with the IDFG and public land management agency.

¹⁷ Wolf trapping and radio-collaring for wolf population monitoring purposes is usually conducted on public land and coordinated with the IDFG and public land management agency.

An additional lethal method which might potentially be employed under the Proposed Action would be considered only in limited circumstances when attempting removal of entire packs of chronic depredating wolves. IDFG authorizes removal of entire packs of wolves in those cases where a pack has been implicated in repeated depredations on livestock over a period of time. When these types of removal efforts occur during the spring months, there may infrequently be situations involving a pack with pups in a den. If the entire pack is to be removed, this would include the pups in the den. Excavating the den to reach the pups could involve unnecessary health and safety risks, and the most practical, humane approach to this infrequent scenario would be to employ the use of an EPA-registered den fumigant to euthanize the pups in the den. The potential use of this method will be discussed in Chapter 4.

An additional management strategy under the Proposed Action could potentially be the infrequent use of sterilization of one or both alpha wolves from packs implicated in chronic depredations on livestock, or from packs targeted for removal at the request of IDFG to protect ungulates. For protection of livestock, this option would be considered on a case-by-case basis in those instances where IDFG has authorized removal of an entire pack of chronic depredating wolves. In these cases, if IDFG and the affected livestock producers concurred, all of the wolves except the alpha pair would be slated for lethal removal, while the alpha pair would concurrently be live-captured, surgically sterilized, radio-collared and released to maintain and defend their territory against other wolf packs which might be more likely to prey on livestock. Comparison of livestock losses prior to and after employing this strategy could provide indications regarding whether or not this experimental approach may be worthwhile. IDFG's Policy for Avian and Mammalian Predation Management would ordinarily preclude consideration of birth control or sterilization as a management tool, but the IDFG Director has concurred with exploring this approach on a limited trial basis as a possible wolf damage management tool. A rigorous scientific study design would be developed and implemented if this approach were to be employed beyond an initial 1-2 breeding pairs. The possible use of this strategy will be discussed further in Chapter 4.

3.2.3 Alternative 3 – Nonlethal Wolf Damage Management Only

This Alternative works in much the same manner as the Preferred Alternative except Idaho WS would only use and provide advice on nonlethal methods for wolf damage management. The IDFG and property owners would still be able to use lethal methods in accordance with state laws and the Idaho Wolf Conservation and Management Plan (ILWOC 2002) and Idaho Wolf Population Management Plan 2008-2012 (IDFG 2008a) guidelines.

Nonlethal methods used or recommended by WS could include animal husbandry practices, installation of fencing, electronic guards, fladry and turbo-fladry, aversive conditioning, nonlethal projectiles, use of livestock guarding animals, and/or other nonlethal methods as appropriate. WS would still investigate complaints to determine if complainants meet criteria for wolf damage compensation, and could assist IDFG with radio-collaring wolves for monitoring purposes and/or to enhance effectiveness of nonlethal deterrents such as the RAG. WS could live-capture wolves or wolf-dog hybrids, but IDFG would decide about the disposition of any such animals.

3.2.4 Alternative 4 – No Federal Wolf Damage Management in Idaho

Under this Alternative, WS would not be involved in wolf damage management in Idaho, but the IDFG and property owners would still be able to use lethal and nonlethal methods in accordance with state laws, ILWOC (2002) and IDFG (2008a) guidelines.

If this Alternative is selected, WS would not provide any assistance with wolf damage and conflict management in Idaho. All requests for wolf damage management would be referred to the IDFG or the Nez Perce Tribe, as appropriate. The IDFG, under Idaho legislative direction, would continue to implement the state wolf management plans (ILWOC 2002, IDFG 2008a), similar to all the Alternatives with or without WS assistance.

3.3 WOLF DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES

Wildlife damage management is defined as the alleviation of damage or other problems caused by or related to the presence of wildlife (USDA 1994) and an integral part of wildlife management (The Wildlife Society 1992). Wildlife damage management approaches and strategies that could be used are described below.

3.3.1 Integrated Wildlife Damage Management (IWDM)

During more than 90 years of resolving human/wildlife conflicts, WS has considered, developed, and used numerous methods for reducing wildlife damage problems (USDA 1994). WS' efforts have involved research and developing new methods, improving existing methods and implementing effective strategies to resolve and prevent wildlife damage. Usually, the most effective approach to resolve wildlife damage is to integrate the use of several methods simultaneously or sequentially. Adaptive IWDM is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel. The WS Program applies IWDM to reduce damage after applying the Decision Model discussed in Section 3.3.3 to develop site-specific, adaptive management strategies (Slate et al. 1992). The philosophy behind IWDM is to implement effective management techniques in the most cost-effective¹⁸ manner while minimizing the potentially harmful effects to humans, target and non-target species, and the environment.

IWDM draws from the largest possible array of options to create a combination of techniques for specific situations. IWDM may incorporate cultural practices, habitat modification, animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problem. The WS program also works closely with the researchers with the USDA, APHIS, WS' NWRC, the research arm of the WS program. The NWRC Research Station at Utah State University is the leading predator research complex in the world and scientists there are dedicated to developing new methods to reduce predator damage. Research associated with this facility has been critical to the testing and development of nonlethal methods for wolf damage management (Shivik 2001, Shivik and Martin 2001, Bangs and Shivik 2001, Shivik et al. 2002, Shivik et al. 2003), and has improved the selectivity, humaneness and efficacy of capture devices. State WS programs assist the NWRC with research projects and, because of the close collaboration between NWRC and the state programs, the latest research findings are incorporated into state operational programs.

3.3.2 IWDM Strategies

3.3.2.1 Technical Assistance Recommendations (implementation is generally the responsibility of the requester)

Technical assistance includes demonstrations and/or recommendations on the proper use of some management devices (*e.g.*, propane exploders, electronic guards, fladry, etc.) and information on

¹⁸ The cost of control may be a secondary concern because of overriding environmental, social, biological, health and legal considerations.

animal husbandry, wildlife habits, habitat management and animal behavior modification. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Typically, several management strategies are described to the requester for short and long-term solutions to damage problems. These strategies are based on the level of risk, need and practical application. Technical assistance may require substantial effort by agency personnel in the decision making process, but the actual implementation is the responsibility of the requester. Technical assistance also includes site visits and verification of the cause of damage as may be necessary for available compensation and financial assistance.

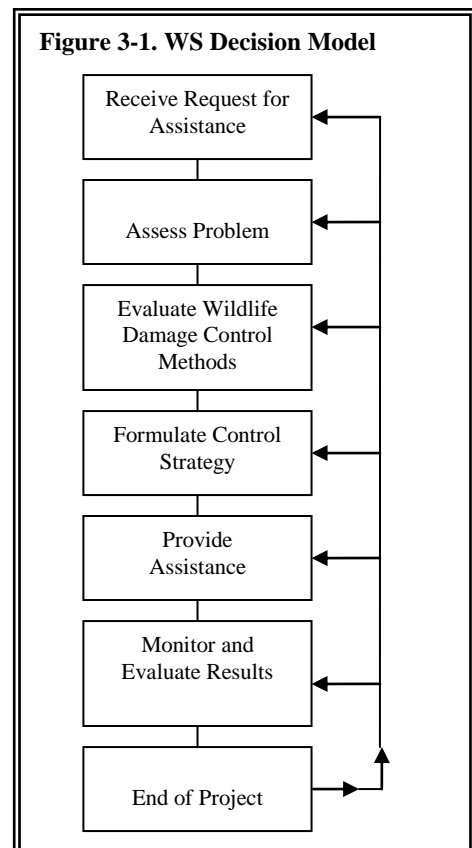
Education is an important element of program activities because wildlife damage management is about finding “balance” or coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature is not in static balance, but rather is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, presentations and demonstrations are provided to ranchers, homeowners and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Education and public outreach activities are available from the IDFG (<<http://fishandgame.idaho.gov/cms/wildlife/wolves/>>), MFWP (<<http://fwp.mt.gov/tmc/vignettes/wolf.html>>) and WDFG (<<http://gf.state.wy.us/services/education/wolvesindex.asp>>), and periodic news releases, and presentations to livestock producers and hunters by the state agencies and WS. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are updated on recent developments in damage management technology, laws and regulations, and agency policies.

3.3.2.2 Operational Damage Management

Situations in which WS personnel conduct wolf damage management activities are referred to as operational damage management. Operational assistance is sometimes provided when the problem cannot practically be resolved through technical assistance. The initial investigation defines the nature and history of the problem, extent of damage, and verifies whether or not the problem is caused by wolves. Professional assistance is often required to resolve problems effectively, especially if the problem is complex, or the management technique requires the direct supervision by or involvement of an experienced wolf damage management professional. Wolf biology, ecology and behavior and other factors are considered (WS Decision Model, Figure 3-1) when developing site specific damage management strategies (Slate et al 1992).

3.3.3 WS Decision Model used for Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints that is depicted by the WS Decision Model (Slate et al. 1992) (Figure 3-1). The Decision Model is a problem-solving process similar to that used by all wildlife management professionals when addressing human/wildlife conflicts. Trained personnel



assess the problem, and evaluate the appropriateness and availability (legal and administrative) of damage management strategies and methods based on biological, economic and social considerations including:

- Species responsible for the damage (did wolves cause the problem or was it another species?)
- Magnitude, geographic extent, frequency, historical damage and duration of the problem including review of animal husbandry practices and producer efforts at nonlethal wolf damage management.
- Status of target and non-target species, including T/E species
- Local environmental conditions
- Potential biological, physical, economic and social impacts
- Potential legal restrictions
- Costs of damage management

Following this evaluation, methods deemed to be practical and potentially effective for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. When damage continues intermittently over time, WS and/or IDFG personnel and the requester monitor and reevaluate the situation. If one method or a combination of methods fails to stop damage, a different strategy is implemented. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of a feedback loop between receiving the request and monitoring the results, with the damage management strategy reevaluated and revised, if necessary.

3.3.4 Local Decision Making Process

Wolf damage management in Idaho follows a “co-managerial approach” to address human/wolf conflicts as generally described by Decker and Chase (1997). Within this management model, trained personnel provide technical assistance regarding the biology and ecology of wolves and effective, practical and reasonable methods available, including nonlethal and lethal methods, to requesters of WS assistance to reduce wolf damage. Technical assistance on alleviating damage caused by wolves is also available from IDFG and private organizations. WS and IDFG may also facilitate discussions at local community meetings when resources are available, and make recommendations. Resource owners and others directly affected by wolf damage or conflicts have direct input into the strategies to resolve the problem(s). They may implement management recommendations provided by WS or others, or may request management assistance from WS or IDFG. Local resource owners compare the benefits versus the damage when deciding which nonlethal methods they would want implemented. Resource owners must weigh the cost of implementing each methodology or a series of methodologies.

3.4 WOLF DAMAGE MANAGEMENT METHODS

USDA (1994, Appendix J) describes the methods currently available for wolf damage management. Several of these were considered in this assessment because of their potential use to reduce wolf damage to agricultural and natural resources, property and pets, and human health and safety. For a discussion of the advantages and disadvantages of various nonlethal and lethal wolf damage management methods used in the Northern Rockies, see Bangs et al. (2006) (http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/06pubs/shivik067.pdf).

3.4.1 Non-Lethal Methods Available to WS, IDFG Personnel and the Public

Some wolf damage management methods are available for anyone to use. These consist of nonlethal preventive methods such as cultural practices (*e.g.* possible changes in livestock management) and localized habitat modification (*e.g.*, clearing brush, improving fencing, etc.) on private property. Cultural practices and other management techniques are implemented by the resource owners/managers. Livestock producers and resource owners/managers would be encouraged to use these methods, based on the level of risk, need and professional judgment on their effectiveness and practicality. WS' and IDFG's involvement in the use of these methods is usually limited to providing recommendations or technical assistance.

Livestock Management Practices are implemented to prevent or reduce wolf damage and may include approaches such as: 1) maintaining healthy, well-fed animals, 2) pregnancy testing cattle, 3) properly disposing of dead livestock carcasses (*i.e.*, removal, burying, liming, or burning), 4) conducting calving or lambing operations in close proximity to the ranch headquarters, when practical, 5) penning vulnerable livestock at night where practical, 6) monitoring livestock on a regular basis to detect any disease, natural mortality, or predation, and 7) incorporating nonlethal methods. Property owners and land managers could implement these management practices or request the assistance of other agencies or private organizations to implement them, or take no action.

Exclusion with some type of fence or other barrier may be used to prevent or limit access by predators to livestock pastures, calving or lambing areas, or livestock confinement areas. Where practical and cost effective, sheep, calves or other vulnerable livestock may be penned near ranch buildings at night.

Fladry is a form of barrier and wolf deterrent involving red flags measuring approximately 3 x 18 inches, strung about 20 inches apart, hanging from a thin rope or cord suspended about 30 inches above the ground. Fladry is installed around pastures or other areas where livestock are confined to discourage wolf access. Part of the repellency provided by fladry is probably related to the frequent human visitation required to ensure that the flags remain freely suspended and that the line is properly maintained. Like many other frightening devices, wolves eventually habituate to this deterrent, but field trials in Idaho have shown that fladry may provide deterrence for as long as 60 days (Musiani et al. 2003). Davidson-Nelson and Gehring (2010) reported that if maintained, fladry can exclude wolves from livestock for up to 75 days, however, Shivik et al. (2003) found that fladry did not effectively protect bait sites from scavengers, including wolves.

Turbo-Fladry is very similar to regular fladry with the exception that the rope is substituted with electrified wire attached to a standard livestock electric fence generator. As wolves habituate to the fladry line and try to cross under it, the negative stimulus they receive after getting shocked by the electrified barrier can increase the amount of time the barrier may remain effective.

Livestock guarding animals such as large, aggressive breeds of guarding dogs (*e.g.*, Great Pyrenees, Akbash, etc.) have been used with some success to protect livestock from wolves, but multiple guard dogs work better than just one or two guard dogs (Bangs et al. 2005, Urbigkit and Urbigkit 2010). Even with 3 or more dogs present, wolves occasionally kill or severely injure livestock guarding dogs. Livestock guarding dogs are not so much killed as prey as they are out of interspecies aggression (Bangs et al. 2005). Other types of livestock guarding animals, such as llamas, which have been shown in some circumstances to be effective in protecting sheep from coyotes, are not as effective in deterring wolves. Wolves probably view llamas as prey, and multiple instances of wolves killing and feeding on llamas have been documented in the Northern Rockies (USFWS et al. 2002, 2003, 2005, 2007, 2009, 2010).

Guarding and hazing involves guarding an area and then using pyrotechnics or other frightening devices to frighten wolves from the site. Hazing can be used as an aversive technique, but requires that the projectiles be used consistently whenever the animal attempts to prey on the protected resource so they do not identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004). If there are any radio-collared wolves in a pack which may pose a threat to livestock, nonlethal hazing efforts can be enhanced if the livestock producer or other personnel make use of a radio receiver to determine when wolves are near or approaching the livestock (Bangs et al. 2006). This requires diligent and persistent monitoring, but can make hazing much more effective.

Frightening devices are methods that usually involve lights, sound and/or motion devices designed to deter wolves from a certain area. Strobes and flashing lights, propane exploders, sirens, and various combinations of these devices have all been used in attempts to reduce livestock losses, with wide-ranging degrees of effectiveness (Linhart 1984, Andelt 1987). Animal habituation (becoming accustomed) to the stimulus is one of the primary limiting factors for repellents. Essentially, anything new or different is likely to elicit avoidance behavior by canids, but this effect disappears over time. Moving the devices intermittently and randomly as well as alternating the stimuli (*e.g.*, a different type of noise or light) may extend the effective period of the system (Shivik and Martin 2001). The period of efficacy may also be extended by using systems which are motion-activated or only activated when a wolf wearing a transmitter collar comes into close proximity to the protected site. The RAG is one such frightening device that employs this approach, and RAG devices have been field-tested in Idaho with some success (Breck et al. 2002). Use of the RAG in Idaho has been most effective in protecting livestock in small (≤ 40 -60 acre), fenced-in areas.

Compensation for wolf damage does not reduce wolf damage, and does not preclude implementation of lethal control actions, but can help offset some of the costs of living with wolves. In some cases it may also help provide incentive to consider nonlethal methods of wolf control. Several different wolf damage compensation programs are available to livestock producers in Idaho, but the one element common to all of these programs is the requirement that losses be confirmed as wolf damage. WS employees are often able to provide this confirmation as part of the initial investigation into complaints of wolf damage, but in some cases, the evidence remaining is insufficient to confirm that a wolf or wolves actually killed the animal. Depending on the circumstances, partial payment may be available for losses that cannot be confirmed, but which are deemed likely, or “probable.” As of 2010, 3 different wolf damage compensation programs are available to Idaho livestock producers, but there is no guarantee how long or if these programs will continue. The compensation program administered by the conservation group Defenders of Wildlife has been the longest running program, followed by the program administered by the Idaho Governor’s Office of Species Conservation, and most recently, a new program administered under the USDA’s Farm Service Agency.

3.4.2 Non-lethal Methods Available to WS, IDFG and the Nez Perce Tribe.

Some nonlethal methods, research projects and population monitoring efforts involve capture and handling wolves which may not be conducted by the general public. Methods that require capture and handling of wolves would only be conducted by IDFG personnel, agencies permitted by IDFG, WS or the Nez Perce Tribe.

Foot-hold traps can be effectively used to live capture wolves, and are an extremely important tool in wolf management. When wolves are trapped they are ordinarily either physically restrained, chemically anesthetized, radio-collared and released on site, or euthanized on site. Effective trap placement, pan-tension devices and the selection and placement of appropriate lures and baits by trained personnel contribute to the foot-hold trap’s selectivity. WS policy requires that foot-hold traps used for wolf damage management have offset and laminated jaws or padded jaws to reduce foot

injury to captured wolves (WS Directive 2.335). Traps may also be modified with small protrusions or “nubs” on the jaws to reduce the likelihood of the wolf’s foot moving back and forth in the jaws, thereby reducing the potential for trap-related injury.

Disadvantages of traps include the difficulty of keeping them operational during rain, snow or freezing weather, and the fact that they cannot be 100% selective. Although pan-tension devices are effective in reducing the likelihood of unintentional capture of nontarget species smaller than wolves (*e.g.*, red fox, coyote), they cannot preclude the occasional capture of larger nontarget species such as mountain lions or black bears. They do, however allow the option of releasing nontarget animals which may infrequently be captured. Whenever WS employees deploy traps for wolves, they post warning signs at access points into the area to alert people to the presence of traps.

Foot snares are devices consisting of a cable loop and a locking device that captures an animal around its foot or lower leg. The cable may be activated around the lower leg with a spring-powered throw-arm (Aldrich-type) or trap-type (Belisle) device. The foot snare can be modified with a stop on the cable to restrict the closure of the loop. Careful snare placement, pan-tension devices and the selection and placement of appropriate lures and baits by trained personnel contribute to the selectivity of this device. As with foot-hold traps, when foot snares are used as a live-capture device, wolves would ordinarily either be radio-collared and released on site, or euthanized. Foot snares are more often used for capture of mountain lions and black bears in Idaho than for wolves.

Dart guns are capture tools that utilize a dart filled with tranquilizer drug, fired from a specially designed firearm. They would ordinarily only be used on wolves when conducting live-capture operations from a helicopter. Once tranquilized, the animal may be handled safely and processed for research or monitoring purposes. Use of dart guns would have no effect on non-target species because positive target species identification is made before animals are darted. Thus, WS’ use of dart guns is expected to continue to be 100% selective for target individuals and species, and would not pose a risk to non-target species and individuals. All WS personnel who would dart wolves or deliver immobilizing drugs attend a minimum 2-day accredited training course and an online distance learning module on immobilizing wildlife, and pass all associated post-course tests. To retain certification, WS employees are required to receive 16 hours of continuing education every 3-years and take and pass an online distance learning module.

Snares can be used to live-capture animals around the neck with the use of a “stop” to prevent full closure of the loop, and improved methods for use are being developed for live-trapping wolves and other carnivores (Olson and Tischaefer 2004). Snares are ordinarily not as affected by rain, snow and freezing weather as foot-hold traps are. These devices offer a degree of selectivity based on the size of the cable loop and the height of the loop above ground level. They also offer a viable live-capture alternative to foot-hold traps during the winter months, when freezing temperatures combined with restricted blood circulation could result in damage to the wolf’s foot.

3.4.3 Non-lethal Methods which may Require Special Authorization from IDFG

Some animal behavior modification systems involve capturing wolves and fitting wolves with radio-transmitting collars to deliver or trigger repellent stimuli (*i.e.*, aversive conditioning). Other systems, sometimes referred to as “less than lethal munitions,” involve shooting wolves with nonlethal projectiles such as rubber bullets or bean bag rounds. These nonlethal techniques involve intentionally using painful stimuli to modify wolf behavior, and IDFG may require permits or other authorizations to use these methods and any other experimental wolf damage management techniques. Methods that require capture and handling of wolves would be conducted only by personnel from IDFG or agency

personnel authorized by IDFG, WS or the Nez Perce Tribe. American Indian tribes have authority to use these methods on tribal lands without permission from IDFG.

Aversive Stimuli are stimuli that cause discomfort, pain and/or an otherwise negative experience paired with specific behaviors to achieve conditioning against these behaviors. One example would be using something like a dog training shock collar that is activated when wolves come into close proximity to a protected area such as livestock pens (Shivik et al. 2003, Schultz et al. 2005).

Nonlethal Projectile use involves guarding an area and then using rubber bullets or other nonlethal projectiles to prevent a predation event. It can be used as an aversive technique, but requires that the projectiles be used consistently whenever the predator attempts to prey on the protected resource, so it is less likely to identify conditions when it can obtain prey without receiving a negative experience (Shivik 2004). Methods which require around-the-clock presence of a person to guard the resource are most efficiently used when the landowner/resource manager assists with the implementation. IDFG may agree to allow the use of these methods and WS to train private individuals to use the method.

Surgical Sterilization of one or both alpha wolves from a pack would only be employed as an alternative to killing those same wolves, as described in the Proposed Action at Section 3.2.2. Bromley and Gese (2001) reported that surgically sterilized coyotes maintained territories and pair bonds similar to non-sterilized coyotes, and that sterilized coyotes killed fewer sheep, since they did not have to kill prey to feed their pups. They further reported that the amount of predation losses averted just in the first year following the sterilization procedure exceeded the costs associated with sterilizing the coyotes. A number of recognized wolf authorities have suggested a similar approach with wolves might be effective in reducing wolf depredations on livestock (Cluff and Murray 1995, Mech et al. 1996, Haight and Mech 1997). The benefits of sterilizing wolves to protect livestock could potentially be much greater than the benefits achieved with coyotes, since wolf territories can be as big as several hundred square miles, whereas coyote territories are closer to 10 square miles. Also, individual wolves are over 7 times more likely to kill sheep and over 170 times more likely to kill cattle than are individual coyotes (Collinge 2008). The larger territory size for wolves, as compared to coyotes, and the greater proclivity for individual wolves to kill livestock would both be expected to contribute to an even greater cost-benefit ratio from sterilizing wolves than has been suggested for coyote sterilization. Although this approach has never been specifically evaluated to assess its potential benefits in reducing wolf predation on livestock, Idaho's relatively high wolf population and annually-occurring wolf predation on livestock would seem to make Idaho a logical place to explore this idea. IDFG's Policy for Avian and Mammalian Predation Management would ordinarily preclude consideration of birth control or sterilization as a management tool, but the IDFG Director has concurred with exploring this approach on a limited trial basis as a possible wolf damage management tool. A rigorous scientific study design would be developed and implemented if this approach were to be employed beyond an initial 1-2 breeding pairs.

3.4.4 Lethal Methods

These methods are specifically designed to lethally remove wolves in certain situations to stabilize, reduce or eliminate damage. The amount of removal necessary to achieve a reduction in wolf damage varies according to the effectiveness of other damage management strategies, the damage situation, and the level and likelihood of continued depredations. Under Alternatives 1 and 2, WS would conduct activities in coordination with IDFG and use the WS Decision Model (Slate et al. 1992) and the guidance in ILWOC (2002) and IDFG (2008a) to determine when lethal management would be used. Under any of the Alternatives, livestock and domestic animal owners, their employees or agents, may shoot a wolf in the act of molesting or attacking said animals (Idaho Statute Title 36-11079(c)). Livestock and domestic animal owners may also be issued permits by IDFG to shoot or

trap wolves, either as part of a regulated public hunting or trapping season, or special case-by-case authorizations in response to wolf damage. The lethal wolf damage management techniques that would be available to WS under Alternatives 1 and 2 would include the use of foothold traps and snares, as described above under Section 3.4.2, followed by euthanasia, typically by gunshot to the head, as recommended by the American Veterinary Medical Association (AVMA 2007). Additional lethal methods used under Alternatives 1 and 2 would include shooting, from the ground as well as from fixed-wing aircraft or helicopters. An additional lethal method which might potentially be employed in limited circumstances under Alternative 2 would be the use of an EPA-registered den fumigant (carbon monoxide) to euthanize pups in their dens.

Shooting from the ground is highly selective for the target species, and may be employed in conjunction with the use of auditory attractants (*e.g.*, sounds of prey animals in distress, or imitations of wolf vocalizations). Removal of one or two specific animals by shooting in the problem area can sometimes provide immediate relief from a predation problem. Shooting is often tried as one of the first lethal control options because it offers the potential of solving a problem more quickly and selectively than some other options, but it requires visually sighting the wolf within effective shooting distance. Shooting may sometimes be one of the only control options available if other factors preclude the setting of equipment. During the 5-year period of FY 05 - FY 09, 17% of all wolves lethally taken by WS in Idaho were taken by shooting from the ground (USDA 2010).

Aerial Shooting typically involves visually locating suspected depredating individuals or packs from either a small single-engine fixed-wing aircraft or a helicopter, and shooting them from the aircraft with a shotgun. Shooting typically results in a relatively quick death. Depredation problems can sometimes be resolved very quickly and effectively through aerial shooting (*e.g.*, by starting the aerial operation in the vicinity of a recent wolf kill, and catching the wolf or wolves when they've returned to feed on the livestock carcass.). Cain et al. (1972) rated aerial shooting as "very good" in effectiveness for problem solving, safety, and lack of adverse environmental impacts. Smith et al. (1986) cited cost-effectiveness and efficacy as benefits of aerial shooting.

Good visibility is required for effective and safe aerial shooting operations, and relatively clear and stable weather conditions are necessary. Summer conditions limit the effectiveness of aerial shooting because the increased vegetative cover makes finding the animals more difficult, and the higher ambient air temperatures reduce air density, which affects low-level flight safety.

Aerial shooting is one of the most effective wolf damage control tools available, and more wolf damage problems are resolved through aerial shooting than by any other method. In the 5-year period of FY 05 - FY 09, about 50% of all wolves lethally taken by Idaho WS were taken by aerial shooting (USDA 2010).

Gas Cartridges are registered by the EPA (registration #56228-21) for euthanizing predators in their dens. Destruction of wolf pups in a den would be expected to occur infrequently, if ever, and would only occur in those cases where an entire wolf pack is removed and the control action was occurring during the relatively brief period (4-6 weeks) when pups were staying in the den. When used to euthanize predators in their dens, 1 or 2 gas cartridges are typically placed in the den entrance, the fuse is lit, and the den entrance is tightly sealed with soil. When ignited, the cartridge burns at the den entrance and produces large amounts of carbon monoxide, a colorless, odorless, tasteless poisonous gas. The animals in the den succumb to a combination of excess carbon monoxide and oxygen deprivation. Carbon monoxide is recognized by the AVMA as an approved and humane method to euthanize animals (AVMA 2007). The gas cartridge label does not currently include wolves as a

target species, and gas cartridges would not be used for this purpose unless a Special Local Needs registration was obtained through the Idaho State Department of Agriculture.

Sodium Pentobarbital (Beuthanasia®-D) is registered for euthanasia of dogs, but may legally be used on other animals if the animal is not intended for human consumption. Barbiturates depress the central nervous system in descending order, beginning with the cerebral cortex, with unconsciousness progressing to death. The primary advantage of barbiturates is the speed of action on the animal. Barbiturates induce euthanasia smoothly, with minimal discomfort to the animal (AVMA 2007). This method of euthanasia would likely only be used in the rare circumstance where an already sedated wolf was determined to have health or injury issues such that it would be most appropriate to euthanize the animal.

3.5 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONALE

3.5.1 Bounties

Bounties are payment of funds for killing wildlife suspected of causing economic losses but is not considered effective to reduce wolf damage at this time. This alternative will not be considered in detail because:

- IDFG has not authorized a bounty program for wolves.
- Bounties are generally not effective in reducing damage because depredating individuals/local populations are not specifically targeted.
- No effective process exists to prevent taking of animals from outside the damage management area for compensation purposes.
- Fraudulent claims can occur (Waller and Errington 1961).

3.5.2 Eradication and Suppression

An eradication alternative would direct all WS program efforts toward planned, total elimination of wolves. This alternative will not be considered in detail because:

- The attempted eradication of established wolf populations is contrary to State and Federal efforts to protect and conserve wildlife and contrary to ESA requirements.
- Eradication of wolves is not acceptable to most members of the public.
- It is also not realistic, practical, or allowable under present WS policy to consider large-scale population suppression.

3.5.3 Agencies Exhaust All Nonlethal Methods Before Attempting Lethal Methods

Under this alternative, all nonlethal methods would have to be attempted and proven ineffective prior to using lethal wolf damage management methods even though, in the professional judgment of WS and IDFG personnel, some methods that would have to be attempted would be impractical (*e.g.*, would incur costs in excess of value of resources protected), inappropriate (*e.g.*, use of a light siren device in areas near other residences) or likely to be ineffective for the particular situation (*e.g.*, situations where animal appears to have habituated). This alternative will not be addressed in detail for a number of reasons including: 1) time and resources of agencies and individuals experiencing damage may be unnecessarily expended when nonlethal methods are unlikely to be effective, based on circumstances and experience; 2) the potential that additional losses could be incurred while experimenting with nonlethal methods may be unacceptable to some and would likely result in an increase in individuals seeking to solve their own problems instead of working with WS or IDFG; and 3) experimenting with

nonlethal approaches may not be appropriate in the rare instance of a wolf-related risks to human safety.

3.5.4 Lethal Only Program

Under this alternative, IDFG and WS would only provide technical and operational assistance with lethal damage management techniques. Prohibiting IDFG and WS from using or providing technical assistance on effective and practical nonlethal wolf damage management methods is not in the best interest of the continued recovery of the species, is contrary to agency policy and directives (WS Directive 2.101), and will not be analyzed further. In certain situations, nonlethal methods may provide a more effective long-term solution to wolf damage problems than lethal methods.

3.5.5 Technical Assistance Only

Under this alternative, WS would not conduct operational wolf damage management in Idaho but could provide information to requesters about methods or techniques they could use to reduce wolf conflicts. WS would also be able to conduct investigations of potential wolf depredation sites as required to administer the wolf damage compensation program. Because IDFG could still use and authorize others to use nonlethal and lethal wolf damage management techniques, the environmental impacts of this alternative are encompassed by evaluation of Alternatives 1, 2, 3, and 4. Detailed analysis of this alternative would not contribute substantive additional information to the understanding of environmental impacts of damage management alternatives, so this alternative will not be analyzed in detail.

3.5.6 Wolf Damage Management Conducted by Licensed/Permitted Hunters and Trappers

With wolves removed from the Federal list of threatened and endangered species, IDFG could attempt to address wolf depredation problems by providing for take of depredating wolves primarily by private individuals holding appropriate licenses or permits issued by IDFG. A major problem with this approach however, is that private hunters and trappers would not always have the time, resources, or training to promptly and effectively respond to site-specific damage problems. Salvage of wolf hides obtained through private depredation control activities could conceivably be authorized by IDFG as an incentive to promote this approach, but the majority of wolf damage problems occur during April through September when pelts would not be in prime condition for salvage and are of little value. Also, as noted in Section 3.4.4, about half of the lethal take of wolves during wolf damage control operations is typically accomplished through aerial shooting, and the resources and expertise to conduct this activity would not likely be available to private hunters and trappers. To the extent that IDFG might be able to focus hunter and trapper harvest of wolves in areas of chronic wolf depredation problems through the establishment of targeted hunting seasons and quotas, the cumulative impacts of this approach are already encompassed to a degree within evaluation of the other alternatives being analyzed. This approach would also be a nonfederal action and outside the scope of NEPA.

3.6 STANDARD OPERATING PROCEDURES FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

Mitigation measures and SOPs improve the safety, selectivity and efficacy of wildlife damage management techniques. Most of the SOPs used by the WS program are discussed in detail in USDA (1994, Chapter 5). The following measures and SOPs apply to some or all of the Alternatives, as indicated in the columns. These SOPs only describe actions by WS and do not include actions by IDFG. In some cases, if an action is not taken by WS, it may be implemented by IDFG.

- Alternative 1 - Continue the Current Wolf Damage Management program (No Action).
- Alternative 2 - Expanded Wolf Damage Management Program (Proposed Action).
- Alternative 3 - Nonlethal Wolf Damage Management Only.
- Alternative 4 - No Federal Wolf Damage Management in Idaho.

Standard Operating Procedures by Alternative	1	2	3	4
<i>General Procedures and Conditions for Conducting Wolf Damage Management</i>				
WS wolf damage management would follow guidelines as specified and agreed upon in MOUs (IDFG and ISADCB 2002) and IDFG (2008a) guidelines.	X	X		
WS would conduct wolf damage management only when and where a need exists.	X	X	X	
Wolf-dog hybrids could be killed by WS if they appear to be living in the wild and are unmarked, or they would be held in captivity while attempts are made to locate the owner. If no owner could be located, depredated wolf-dog hybrids could be euthanized.	X	X		
Nonlethal methods would be used when practical and effective, but lethal methods could also be applied alone or in combination with nonlethal methods in some cases to most effectively resolve a damage problem.	X	X		
WS could use lethal methods to remove wolves in cases of threats to human safety	X	X		
WS would not initiate use of lethal wolf damage management methods for protection of livestock until an authorizing agreement has been signed by the producer.	X	X		
Lethal depredation management activities would occur within specific areas as specified by the IDFG.	X	X		
All wolf mortalities while conducting wolf damage management and wolf population monitoring would be reported to the appropriate IDFG Regional and/or State office.	X	X	X	
Wolves or wolf parts taken during wolf damage management may be transferred to Native Americans for cultural purposes, educational use, or scientific research purposes when coordinated with and approved by IDFG. Specimens not suitable, or not needed, for such use would be disposed of as directed by IDFG.	X	X		
<i>Animal Welfare and Humaneness of Methods Used by WS</i>				
Nonlethal wolf damage management methods such as guard dogs, scare devices, fladry and other methods, would be recommended and implemented when appropriate.	X	X	X	
WS could provide training to landowners and resource managers in the safe and effective use of nonlethal projectiles when appropriate.	X	X	X	
Wolf capture, handling, and euthanizing (if permitted) would be carried out as humanely as practically possible.	X	X		
Traps and snares would be checked consistent with IDFG rules and WS policy.	X	X	X	
Research would continue to improve the selectivity and humaneness of management devices and these would be implemented into the WS Program.	X	X	X	
Foot-hold traps would be equipped with pan-tension devices to reduce the incidence of smaller non-target animal captures.	X	X	X	

Standard Operating Procedures by Alternative	1	2	3	4
All WS Specialists dealing with wolf complaints would be trained in the capture, chemical immobilization, and medical handling of wolves to minimize accidental injury and death.	X	X	X	
Nonlethal projectiles (<i>e.g.</i> , rubber bullets and bean bag projectiles) may be used if authorized by IDFG.	X	X	X	
Nonlethal projectiles would be used in a manner which would be unlikely result in any permanent physical damage to a wolf.	X	X	X	
Personnel would be trained in the safe and appropriate use of wolf damage management techniques and equipment.	X	X	X	
<i>Safety Concerns Regarding Use of Capture Devices</i>				
The WS' Decision Model, designed to identify the appropriate wildlife damage management strategies and their impacts, is used.	X	X	X	
WS would place traps and snares so that captured animals would not be readily visible from publicly used travel routes.	X	X	X	
Warning signs would be posted on main roads and/or trails leading into any areas where traps or snares were being used. These signs would be removed at the end of the damage management activities.	X	X	X	
No traps or snares would be used by WS within ¼ miles of any residence, community, or developed recreation site, unless granted permission from the owner of a privately-owned property or an official from the appropriate public land management agency.	X	X	X	
<i>Concerns About Impacts of Wolf Damage Management Activities on T/E Species, Other Species of Special Concern, and Cumulative Effects.</i>				
WS consulted with the USFWS on the impacts of predator control activities to Federally listed T/E species found in Idaho and will adopt Reasonable and Prudent Measures established by the USFWS for the protection of T&E species.	X	X	X	
WS personnel would attempt to resolve depredation problems by taking action against individual problem animals, or local populations or groups.	X	X	X	
WS foot-hold traps or spring activated foot snares set for wolves would incorporate tension devices to reduce the likelihood of capturing smaller non-target species.	X	X	X	
WS would not set foot-hold traps or snares for wolves within 30 feet of any exposed bait or animal carcass to reduce the likelihood of capturing non-target species.	X	X	X	
The only pesticide product potentially used to euthanize wolves would be the EPA-registered gas cartridge, and only in rare circumstances when pups from a chronic depredating pack of wolves had been authorized for removal.		X		
The USFWS, IDFG, or the appropriate land manager, as appropriate, would be notified as soon as possible, if a State or Federally listed T&E species is caught or killed.	X	X	X	
<i>Cultural Resources/Native American Concerns.</i>				

Standard Operating Procedures by Alternative	1	2	3	4
This EA has been provided to Native American Tribes in a “pre-decisional” form to determine if cultural issues have been addressed.	X	X	X	X
On private lands within recognized reservation boundaries WS will ask the affected landowner if the appropriate reservation personnel can co-investigate any complaint with WS. If allowed by the landowner, the tribe may co-investigate the complaint. WS and the tribe will consult regarding a course of action to address or resolve verified wolf complaints on these lands.	X	X	X	
WS will comply with requirements for notifying tribes as requested by the tribes.	X	X	X	
<i>Public Land Issues</i>				
On public lands, vehicle use would be limited to existing roads unless otherwise authorized by the land management agency.	X	X	X	
WS will meet annually with the land management agency to develop Work Plans which include delineation of areas where certain methods may not be used, for all or part of the year.	X	X	X	
Public land agencies will review work plans for consistency with land and resource management plans.	X	X	X	
If wolf damage management were ever requested to take place in Wilderness Areas or Wilderness Study Areas, it would only be conducted in coordination with the responsible land management agency and under applicable guidelines.	X	X	X	

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

NEPA requires Federal agencies to identify and assess reasonable alternatives to a proposed action that will avoid or minimize adverse effects of these actions upon the quality of the human environment (40 CFR 1500.2e). Chapter 4 provides information needed for making informed decisions concerning alternatives for reducing human/wolf conflicts (*i.e.*, conducting wolf damage management) in Idaho outlined in Chapter 1, the issues and affected environment discussed in Chapter 2, and the Alternatives discussed in Chapter 3. This chapter analyzes the environmental consequences of each Alternative and consists of: 1) analysis of environmental consequences, 2) analysis of each Alternative against the issues considered in detail, and 3) summary of impacts. Wolves will be present in Idaho regardless of which Alternative is selected (IDFG 2008a), but the conflicts with humans could vary by Alternative; different management philosophies and tools will lead to different outcomes. The actual outcomes will result from IDFG management decisions as provided for in the Idaho Wolf Conservation and Management Plan (ILWOC 2002) and the Idaho Wolf Population Management Plan (IDFG 2008a) and the impacts are analyzed using the best available information and historical data.

CEQ (1981) guidance states that the “No Action” Alternative can be defined as being the continuation of current management practices. Data are available on the environmental impacts of the Current Program (the No Action Alternative, or Alternative 1), so the Current Program will be used as the baseline for comparison with the other Alternatives to determine if the real or potential impacts are greater, lesser, or similar. Cumulative environmental impacts result from incremental consequences added to other past, present, and reasonably foreseeable wolf management actions by the USFWS, IDFG, Nez Perce Tribe, other agencies or individuals based on IDFG (2008a) management and conservation plans. While impacts can be predicted, it is also possible for IDFG to mitigate or lessen impacts, based on how and when specific management strategies described for each Alternative are implemented. IDFG intends to lessen the impacts to a recovered wolf population where possible and maintain a secure and healthy population (IDFG 2008a). Rather than a wolf or no-wolf analysis, this EA analyzes the consequences of a spectrum of wolf conservation and management Alternatives. A summary of the consequences associated with each Alternative is presented at the end of this chapter (Table 4-3).

The Idaho Fish and Game Commission has authority to classify wildlife under Idaho Code 36–104(b) and 36–201; the gray wolf was classified as endangered in Idaho until March 2005 when it was reclassified as a big game animal. Idaho statutes (Title 36) have penalties associated with illegal take of big game animals and these rules are consistent with IDFG (2008a, Idaho Code 36–1402, 36–1404, 36–202(h)). ILWOC (2002) directs the IDFG as the primary management agency for wolves in Idaho after delisting and to maintain a minimum of 15 packs as a substantial safety margin over the 10 breeding pair minimum (USFWS 1987, 1994), and to manage wolves as a viable self-sustaining population that will never require relisting under the ESA. Wolves are subject to “defense of property” regulations similar to those that were in effect under the ESA.

ILWOC (2002) called for the State to coordinate with WS to reduce depredation by wolves, depending on the number of wolves in Idaho, and for a balanced educational effort. In November 2007, Idaho released a Wolf Population Management Plan for public review and comment (IDFG 2008a). That plan is a more detailed step-down management plan compared to the general guidance provided in ILWOC (2002) and discusses how the population will likely be well above 20 breeding pairs and provides for wolf hunting opportunities when their population is above that level (IDFG 2008a). Human-caused mortality will be regulated as per ILWOC (2002) and IDFG (2008a) to maintain a recovered wolf population.

4.1.1 Background Important to the Analysis

4.1.1.1 Status of the NRM and Idaho Wolf Population

USFWS (1987) initially specified a recovery criterion of a minimum of 10 breeding pairs¹⁹ of wolves for a minimum of 3 successive years in each of 3 core recovery areas. USFWS (1994) subsequently revised wolf recovery parameters in the NRM to stipulate that “Thirty or more breeding pairs comprising some 300+ wolves in a metapopulation, with genetic exchange between subpopulations, should have a high probability of long-term persistence.” In addition, the metapopulation configuration and distribution throughout secure suitable habitat (*e.g.*, YNP, NW Montana and central Idaho) would ensure that each core recovery area would provide a recovered population that would be distributed over a large enough area to provide resilience to natural or human-caused events²⁰ that might temporarily affect one core recovery area. USFWS (1994) further determined that a metapopulation of this size and distributed among the three core recovery areas within the identified NRM DPS would result in a wolf population that would fully achieve recovery objectives.

The USFWS conducted another review of what constitutes a recovered wolf population in 2001 and 2002 (USFWS et al. 2002, 2003) to re-evaluate and update USFWS (1994). Experts strongly (78%) supported USFWS (1994) conclusions and agreed that wolf population viability was enhanced by higher (500 or more wolves) rather than lower population levels (300) and longer (more than 3 years) rather than shorter (3 years) demonstrated time frames. The USFWS also determined that an essential part of achieving recovery is an equitable distribution of wolf breeding pairs²¹ and individual wolves in Idaho, Montana and Wyoming and the three core recovery areas, and concluded that NRM wolf recovery and long-term wolf population viability is dependent on its distribution as well as maintaining the minimum numbers of breeding pairs and wolves.

Minimum recovery goals (an equitably distributed NRM wolf population that never goes below 100 wolves and 10 breeding pairs in Montana, in Idaho, and in Wyoming) have been exceeded in the NRM DPS every year since 2002 (USFWS et al. 2010), and as listed in the Federal and State recovery plans, all threats in the foreseeable future have been sufficiently reduced or eliminated in Idaho and Montana. Wolves in Idaho and Montana have therefore been removed from the federal list of T&E species. (The delisting decision has been challenged in court, and depending on the outcome of that litigation in 2010 or 2011, the delisting decision for wolves in Idaho and the rest of the Northern Rockies could conceivably be overturned.) Further, the State of Idaho (ILWOC 2002) adopted State laws and management plans that meet the requirements of the ESA to conserve a recovered wolf population into the foreseeable future (IDFG 2008a, 73 FR 10514-10560, 74 FR 15123-15188).

To ensure that the NRM wolf population continues to exceed the recovery goal of 30 breeding pairs and 300 wolves, (ILWOC 2002, IDFG 2008a) Idaho committed to manage for at least 15 breeding pairs in mid-winter and maintain its metapopulation structures. The NRM DPS occupies nearly 100% of the core recovery areas recommended in the 1987 recovery plan (*i.e.*, central Idaho, the Greater Yellowstone Area (GYA), and northwestern Montana) (USFWS 1987) and nearly

¹⁹ Defined as two wolves of opposite sex and adequate age, capable of producing offspring.

²⁰ No wolf population of this size and distribution has gone extinct in recent history unless it was deliberately eradicated by humans (Boitani 2003).

²¹ Uniform distribution is not necessary, however a well-distributed population with no one State/recovery area maintaining a disproportionately low number of packs or number of individual wolves is needed to maintain wolf distribution in and adjacent to core recovery areas and other suitable habitat throughout the NRM.

100% of the areas where suitable habitat was predicted to exist, and the wolf population would live in northern and central Idaho and the GYA (USFWS 1994). This pattern is expected to continue, because management plans for public lands in the NRM DPS result in forest cover, high ungulate densities, low to moderate road and livestock densities, and other factors critical to maintaining suitable wolf habitat. These goals were designed to provide the NRM gray wolf population with sufficient representation, resilience, and redundancy for its long-term conservation (73 FR 10514-10560).

4.1.1.2 Wolf Habitat in the NRM and Idaho

The USFWS used two models to identify wolf habitat (Oakleaf et al. 2006²², Carroll et al. 2006²³) which predicted different amounts of theoretically suitable wolf habitat in the NRM. Habitat quality for wolves is based on adequate prey and security from excessive human-caused mortality. State regulatory mechanisms in Idaho and Federal land management practices/guidelines restrict the location and extent of development on public lands, and these activities are not expected to substantially impact prey or wolf security (USFS 2006).

The area in the NRM DPS currently occupied by persistent wolf packs was determined by circumscribing a line around the outer points of radio-telemetry locations of all known wolf pack territories²⁴ in 2006 (USFWS et al. 2007). The overall distribution of wolf packs has been similar since 2000, despite a wolf population that has more than doubled (USFWS et al. 2001, 2002, 2003, 2004, 2005, 2006, 2007; Bangs et al. 2009); however, habitat occupied by persistent wolf packs fluctuated from 106,384 mi² in 2004 to 100,593 mi² in 2005 to 113,949 mi² in 2006 (USFWS et al. 2005, 2006, 2007, 2009). At the end of 2006, the estimated persistent wolf packs occupied approximately 45,776 mi² in Idaho (USFWS et al. 2007). Landownership in the NRM area occupied by persistent wolf packs is 73,931 mi² Federal (65%); 5,225 mi² State (4.6%); 2,546 mi² Tribal (2.2%); and 31,087 mi² private (27%) (USFWS et al. 2007). For a comparison of wolf distribution in Idaho between 2005 and 2009, see the wolf activity and distribution maps at <http://fishandgame.idaho.gov/cms/wildlife/wolves/manage/05_activity_map.pdf> and <http://fishandgame.idaho.gov/cms/wildlife/wolves/manage/09_map.pdf>

The GYA and central Idaho core recovery areas are primarily composed of public lands (USFWS 1994) and are the largest contiguous blocks of suitable habitat within the NRM. Central Idaho and the GYA provide secure wolf habitat and abundant ungulate populations (USFWS 1994) and lands are not available for development due to their land-use classifications, management guidelines for other species (*i.e.*, grizzly bears, Canada lynx), habitat, access, and geological characteristics (USFWS 1993, 1996, 2007a; Serhveen et al. 2003; USFS 2006). Thus, these areas will continue to provide suitable habitat for a resident wolf population and will be a dependable source of dispersing wolves to help maintain a viable wolf population in the NRM (USFWS 1994). Wolves also disperse into the Idaho Panhandle and central Idaho from Canada and some packs have trans-boundary territories, helping to maintain the wolf population in Idaho (Boyd et al. 1995, Mack et al. 2010).

²² In total, Oakleaf et al. (2006, p. 559) ranked 65,725 mi² as suitable habitat in Montana, Idaho, and Wyoming.

²³ Carroll et al. (2006) predicted the potential effect of increased road development and human density expected by 2025 on suitable wolf habitat. Within the NRM DPS, Carroll et al. (2006) ranked 107,096 mi² as suitable including 40,924 mi² in Montana; 31,856 mi² in Idaho; 29,808 mi² in Wyoming; 2,556 mi² in Oregon; 1,655 mi² in Utah; and 297 mi² in Washington. Approximately 96% of the suitable habitat 102,588 mi² within the NRM DPS occurred in Montana, Idaho, and Wyoming. According to Carroll et al. (2006), approximately 28% of the NRM DPS is ranked as suitable habitat.

²⁴ The USFWS does not believe that any traditional land-use practices in the NRM DPS need be modified to maintain a recovered wolf population in the foreseeable future, because about 71% of the occupied habitat is in public ownership that is managed for multiple uses that are complementary with suitable wolf habitat and maintenance of viable wolf populations (Carroll et al. 2003, Oakleaf et al. 2006).

There appears to be enough habitat connectivity between occupied wolf habitat in Canada, northwestern Montana, GYA and Idaho to ensure exchange of sufficient numbers of dispersing wolves to maintain demographic and genetic diversity in the wolf population (Oakleaf et al. 2006, Carroll et al. 2006, Jimenez et al. in prep, vonHoldt et al. 2008). Wolf movements between Canada and northwestern Montana have been documented from radio-telemetry monitoring (Pletscher et al. 1991, Boyd and Pletscher 1999, Sime et al. 2007) and wolf movement between Idaho and Montana, and at least five wolves dispersing into the GYA²⁵ have occurred (71 FR 6634, February 8, 2006). In addition, the Montana (Montana Wolf Management Advisory Council 2003) and Idaho (ILWOC 2002, IDFG 2008a), State wolf management plans commit to maintaining the metapopulation structure and maintaining sufficient genetic diversity, by various methods, including relocation if necessary, to ensure the long-term viability of the wolf population.

Another important factor in maintaining wolf populations is the native ungulate population. Wild ungulate prey in these three areas is composed mainly of elk, white-tailed deer, mule deer, moose, and bison (only in the GYA). Bighorn sheep, mountain goats, and pronghorn antelope are also common but not important, at least to date, as wolf prey. In total, over 500,000 wild ungulates, including about 100,000 elk, are estimated to inhabit Idaho (J. Rachael, IDFG, pers. comm. 2010). Idaho has managed resident ungulate populations for decades and maintains them at densities that would easily support a recovered wolf population; State ungulate management plans commit IDFG to do so into the future (IDFG 2007b).

Cattle and sheep are at least twice as numerous as wild ungulates, even on public lands (USFWS 1994). Livestock are absent or rare in central Idaho wilderness areas and occur at relatively low densities in the Panhandle. Most wolf packs outside these areas have interacted with livestock, primarily cattle. Livestock and livestock carrion are routinely used by wolves, but wolf damage management seeks to discourage chronic killing of livestock (ILWOC 2002, IDFG 2008a). Conflicts between wolves and livestock have resulted in the annual removal of wolves, but the NRM wolf population remains well above recovery levels in spite of these removals (Bangs et al. 1995, 2004, 2005; USFWS et al. 2007; Nadeau et al. 2007, 2008; Mack et al. 2010).

Human growth and development will continue in the NRM and Idaho, including development and conversion of private low-density rural lands to higher density suburban and urban developments, road development and transportation facilities, resource extraction, and more recreationists on public lands²⁶ (Robbins 2007). Despite efforts to minimize impacts to wildlife (Brown 2006), some of this development will make some areas less suitable for wolf occupancy. However, none of these developments and increased human presence will threaten wolf recovery or meaningfully impact the amount of suitable wolf habitat in the NRM in the foreseeable future (Robbins 2007, 73 FR 10514-10560). Wolves are habitat generalists and one of the most adaptable large predators in the world, and only became extirpated because of deliberate human persecution (Boitani 2003, Fuller et al. 2003). Even active wolf dens can be resilient to nonlethal disturbance by humans (Frame et al. 2007). The vast majority of suitable wolf habitat and the current wolf population are

²⁵ Only one individual is known to have dispersed into YNP itself, probably because YNP is saturated with resident packs that would have a low tolerance for dispersing wolves (Boyd et al. 1995, Jimenez et al. in prep, vonHoldt et al. 2007, USFWS et al. 2007, USFWS 2007b).

²⁶ Wolves don't necessarily avoid roads, and in fact readily use forest and logging roads for travel corridors, but road density apparently provides a good measure of human contact which can result in illegal wolf mortality. Other measures of human contact/presence such as human population densities also correspond well to areas occupied by wolf packs (Fuller et al. 1992, Mladenoff et al. 1995). When wolves occur at low densities and large blocks of unoccupied suitable habitat are available, habitat and road density characteristics predict areas where wolves will occur (Mladenoff et al. 1995); however, as wolf densities increase vegetation and habitat characteristics do not predict wolf habitat as well as indices that measure human influence as long as prey is adequately abundant (Potvin et al. 2005).

secure in mountainous forested Federal public land that will not be legally available for or suitable to intensive human development. As of the end of calendar year 2009, the wolf population in the NRM had increased to over 1,700 wolves, including at least 115 breeding pairs, and wolf reproduction was additionally confirmed in both eastern Washington and eastern Oregon (USFWS et al. 2010). The core recovery areas in the NRM have long been recognized as the most likely areas for successful metapopulations with dispersal between subpopulations (USFWS 1980, 1987, 1994; 71 FR 6634-6660).

4.1.1.3 IDFG Management Direction (IDFG 2008a)

The goal of IDFG (2008a) is to ensure that populations are maintained at 2005-2007 population levels (about 500-700 wolves) during the 5-year post-delisting period through adaptive management under the guidelines of the Idaho Wolf Conservation and Management Plan (ILWOC 2002); the current management goal is 518 wolves (IDFG 2009a). Consistent with the delisting rule, the State goal is to ensure the long-term viability of the gray wolf population. In order to ensure the population goal is achieved, IDFG will maintain ≥ 15 breeding pairs (floor threshold). The IDFG will also maintain balanced wolf and prey populations, ensure genetic transfer among states through maintaining connectivity and functional metapopulation processes, and manage wolves to minimize conflict with humans and domestic animals.

Ideally, population objectives will reflect the ability to monitor packs, breeding pairs, and total wolves, as well as harvest, and monitoring objectives in neighboring states. Therefore, the long-term objective is to maintain viable wolf populations in Idaho, achieve short-term harvest goals to reduce conflicts, provide annual harvest opportunity, and provide for non-consumptive benefits (*i.e.*, aesthetics of wolves in the environment) as well. Based on stakeholder input, the most important objective within IDFG (2008a) is conflict resolution, when populations meet or exceed the population goal. Future population goals will reflect knowledge gained each year. However, the statewide population management objective will range between the 2005 and 2007 levels and not be allowed to fall to a level where management of conflicts has to be restricted (< 15 breeding pairs). Furthermore, optimal hunting opportunity and flexibility in conflict resolution can be achieved by maintaining > 20 breeding pairs (Table 4-1). Twenty breeding pairs is not an objective, nor is it a prejudgment about the population level of wolves necessary to avoid conflict. It is however an IDFG management trigger that would require additional protections to ensure the population goal is maintained and achieved (IDFG 2008a).

4.2 EVALUATION OF SIGNIFICANCE OF CUMULATIVE AND UNAVOIDABLE IMPACTS

Each issue analyzed in detail is evaluated under each Alternative and the direct, indirect, and cumulative impacts are analyzed. NEPA regulations describe the elements that determine whether or not an impact is “significant.” Significance is dependent upon the context and intensity of the action. The following factors (adapted from USDA 1994) were used to evaluate the significance of impacts in this EA that relate to context and intensity for this proposal:

4.2.1 Magnitude of the Impact (size, number, or relative amount of impact)

Magnitude is defined in USDA (1994) as “. . . a measure of the number of animals killed in relation to their abundance” and may be determined either quantitatively or qualitatively²⁷. Cumulative impacts

²⁷ IDFG has determined how many wolves will inhabit Idaho to sustain a healthy wolf population, not adversely impact ungulate populations, livestock producers and to provide for harvest (IDFG 2008a)

to Idaho’s wolf population would include the legal wolf removals conducted by WS and IDFG personnel and livestock producers, hunter harvest, natural mortalities, illegal killing of wolves, and any other known sources of mortality. The cumulative impact on Idaho’s wolf population will be considered in the context of the desired population level, as stipulated by IDFG (2008a) and the Idaho Fish and Game Commission (IDFG 2009a).

Table 4.1. Management Direction for Numbers of Breeding Pairs in Idaho (IDFG 2008a).

<10 breeding pairs (USFWS threshold)	10-14 breeding pairs (2002 State Plan threshold)	15-20 breeding pairs (IDFG conflict threshold)	>20 breeding pairs (IDFG hunting threshold)
USFWS status review for relisting	IDFG reviews management policy to determine if changes are needed	IDFG evaluates harvest strategies and need for more conservative harvest	Annual harvest opportunity
Depredations will be addressed with nonlethal control	Control of problem wolves increasingly restrictive	Control of problem wolves incremental and increasingly restrictive	Control of problem wolves allowed under normal circumstances
Monitoring of each pack using radio collars to verify reproduction and survival	Monitoring intensifies to ensure each pack contains some radio-collared wolves to monitor reproduction and survival	Monitoring intensifies to ensure >15 packs contain some radio-collared wolves to monitor reproduction and survival	Use multiple monitoring techniques to document a minimum breeding pair and population estimate

4.2.2 Duration and Frequency of the Impact

Duration and frequency of wolf damage management in Idaho may be highly variable. Biotic and abiotic factors affecting wolf and other wildlife behavior affect the duration and frequency of wolf damage management activities conducted by WS in Idaho. Wolf damage management in specific areas may be longer duration projects, but the frequency of individual actions may be highly variable depending upon any number of factors affecting the behavior of the animals that are causing damage and the location of the potential damage. Wolf damage management would only be conducted by WS when a request for assistance is received, actions are conducted with concurrence from the IDFG, and a demonstrated need is present. IDFG wolf-take authorizations for livestock depredations are typically issued for periods lasting up to 60 days. IDFG mammal predation management plans identify the duration and frequency of wolf management and other activities for the sake of ungulate management.

4.2.3 Geographic Extent

Wolf damage management could occur anywhere in Idaho where wolf damage occurs or potential wolf management has been requested, agreements for such actions are in place, action is warranted as determined by implementing the WS Decision Model (Slate et al. 1992), and control has been authorized by IDFG. Actions would be limited to areas receiving damage from wolves (primarily rural sparsely populations areas), areas with historical wolf damage, areas where a threat of damage exists, or areas designated by the IDFG to receive wolf management based on their assessments and management objectives. IDFG’s mammal predation management plans establish clearly-defined boundaries for activities under the plans.

4.3 SOCIAL AND RECREATIONAL CONCERNS, RESOURCE USE AND IMPACTS ON HISTORIC AND CULTURAL RESOURCES

4.3.1 Social and Recreational Concerns

Social and recreational concerns are discussed throughout the EA, in the Idaho Wolf Conservation and Management Plan (ILWOC 2002), the Idaho Wolf Population Management Plan (IDFG 2008a), USFWS (1994), and in USDA (1994), and relevant portions have been incorporated by reference. Social and recreational concerns are also addressed in the analysis of impacts on stakeholders, including aesthetics of wildlife, hunting opportunities, and humaneness for each of the Alternatives analyzed in detail (Section 4.4).

4.3.2 Irreversible and Irretrievable Commitments of Resources

The following resource values within Idaho would not be adversely affected by any of the Alternatives analyzed in this EA: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These will not be analyzed further.

Other than minor uses of fuels for motor vehicles and electrical energy for office maintenance, there are no irreversible or irretrievable commitments of resources. Based on these estimates, the WS/IDFG wolf damage management program as directed by IDFG (2008a) produces very negligible impacts on the supply of fossil fuels and electrical energy.

4.3.3 Impacts on Cultural, Archaeological and Historic Resources and Tribal Cultural Properties in Idaho

The activities described under all the Alternatives analyzed in this EA would not cause any significant ground disturbances and would not otherwise have the potential to significantly affect the visual, audible, or atmospheric elements of historic properties and thus are not undertakings as defined by the National Historic Preservation Act (NHPA). WS has determined that wolf damage management actions are not undertakings as defined by the NHPA because such actions do not have potential to result in changes in the character or use of historic properties. The Idaho State Historic Preservation Office (SHPO) has previously concurred with WS' assessment that predator damage management activities are unlikely to have any effect on historic properties. A May, 2010 consultation between Idaho WS and the SHPO resulted in another letter of concurrence from SHPO that WS activities as proposed in this EA would not likely result in any effects on historic properties (SHPO 2010). WS also initiated consultation with the Nez Perce, Coeur d'Alene, Kootenai Tribe of Idaho, Shoshone-Bannock and Shoshone-Paiute tribes to determine if these tribes have concerns regarding possible impacts of WS' wolf damage management activities on tribal cultural properties in Idaho, but no concerns were expressed by any of these tribes.

4.4 ISSUES ANALYZED BY ALTERNATIVES

This section analyzes the expected environmental consequences of each Alternative on each of the issues analyzed in detail. The following issues were determined to be relevant, and are analyzed in detail below:

- Effects on the wolf population in Idaho
- Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates
- Effects on public and pet health and safety

- Humaneness and animal welfare aspects of the methods to be used
- Impacts to stakeholders, including aesthetics of wildlife

4.4.1 Alternative 1 - Continue the Current Wolf Damage Management Program (No Action)

Under this and all the other Alternatives, wolf management in Idaho is oriented toward resolving conflicts when and where they occur while maintaining recovery goals (IDFG 2008a). Wolves molesting or attacking livestock or domestic animals may be killed by livestock or domestic animal owners, their employees, agents and animal damage control personnel and no permit is necessary (Idaho Code 36-1107). Wolves so taken shall remain the property of the state and must be reported to IDFG within 72 hours with additional reasonable time allowed if access to the site where the take occurred is limited. Livestock and domestic animal owners may take all nonlethal steps they deem necessary to protect their property. A permit is necessary from IDFG to control wolves not molesting or attacking livestock or domestic animals. “Molesting” for the purpose of this law shall mean the actions of a wolf that are annoying, disturbing or persecuting, especially with hostile intent or injurious effect, or chasing, driving, flushing, worrying, following after or on the trail of, or stalking or lying in wait for, livestock or domestic animals (Idaho Code 36-1107).

Wolf numbers and distribution could fluctuate because of IDFG management actions, private citizens’ actions, changes in prey abundance and distribution, disease and intraspecific strife²⁸ (ILWOC 2002, IDFG 2008a). In response to the level of depredations on livestock and documented effects on some of Idaho’s ungulate populations, the Idaho Fish and Game Commission has directed IDFG to manage wolves at the 2005 population level (of about 500 wolves), and this would be the case regardless of WS activities analyzed under this EA. This level is well above recovery standards for population viability established by USFWS. However, wolf occupation of nearly all suitable habitat would continue as wolves disperse from core areas and colonize new habitats with sufficient prey. In the absence of significant conflicts, wolves could also become established in “island” mountain ranges or even in areas not considered optimal wolf habitat (IDFG 2008a).

4.4.1.1 Effects on the wolf population in Idaho

Alternative 1 has been used by the USFWS and IDFG either under section 4(d) provisions of the ESA, section 10 permits from the USFWS, or authority granted to IDFG by the USFWS; WS has been an agent of the USFWS or IDFG for purposes of resolving and reducing livestock and domestic animal losses caused by wolves. WS implementation and use of integrated wildlife damage management (IWDM) strategies and methods under this Alternative would continue to be similar to that implemented during the period from 1996-2009 under USFWS management prior to delisting in 2009 and as directed by IDFG following delisting (IDFG 2008a). Wolf management in Idaho is guided by the Idaho Wolf Population Management Plan 2008-2012 (IDFG 2008a) which provides a framework for gray wolf management in Idaho. Consistent with the delisting rule, Idaho’s goal is to ensure the long-term viability of the gray wolf population. Adaptive management plays an integral role in learning about wolf population management and helping guide management efforts into the future. IDFG (2008a) is patterned after other IDFG big game species plans. Under IDFG policy, all IDFG management plans must follow guidelines set forth in the IDFG strategic plan called “The Compass” (IDFG 2005).

Under this Alternative, WS would continue to operate as an agent of IDFG, as requested, and would provide technical and operational assistance with nonlethal and lethal wolf damage

²⁸ The central Idaho wolf populations may be nearing saturated conditions where territoriality and pack density limit room for additional breeding pairs so that population growth can only be accommodated through range expansion (IDFG 2008a).

management under the direction of IDFG (2008a) as determined by implementation of the WS Decision Model (Slate et al. 1992). At the end of 2009, the minimum wolf population in Idaho was estimated at 835²⁹ in 94 documented packs, 6 more packs than were reported in 2008. In addition, there were 20 documented border packs counted for Montana, Wyoming and Washington that established territories overlapping the Idaho state boundary and likely spent some time in Idaho. Of the 65 packs known to have reproduced, at least 49 packs qualified as breeding pairs³⁰ and produced a minimum of 204 pups³¹ (Mack et al. 2010). Litter sizes ranged from 1 to 6 pups and the average litter size (based on 29 litter counts) was 4.1 pups. The estimated wolf population at the end of 2009 remained near the same level as at the end of 2008 (Mack et al. 2010).

IDFG wolf management and conservation guidelines and population management guidelines address damage problems while maintaining viable and healthy wolf populations throughout Idaho (ILWOC 2002, IDFG 2008a). The goal of the State's wolf management and conservation plan and Idaho Fish and Game Commission direction is to quickly and efficiently resolve localized wolf conflicts while maintaining healthy wolf populations, and to sustain the wolf population at near the 2005 population level (where the minimum population estimate was 518 wolves) (IDFG 2009a). The goal of IDFG (2008a) is to annually remove wolves through a regulated harvest and to resolve specific conflicts at specific sites (*i.e.*, livestock and ungulate depredation, and reduce potential human health and safety risks). The relationship between the different forms of wolf take for damage management (*e.g.*, take by WS, take by land/property owners under permits and take by the IDFG) is highly interrelated and coordinated. Take by one of these entities is likely to reduce the number of wolves that will be taken by another entity. For example, if lethal wolf damage management by WS successfully resolves a problem, there may be no need for a landowner to take wolves, so take under permits would decline. Conversely, landowner removal of a wolf caught in the act of depredation may reduce or eliminate the need for additional wolf removal by WS. Similarly, in years where regulated harvest has helped reduce the number of wolves and incidents of wolf predation on livestock, there would likely be fewer wolves taken by WS and private property owners during control actions.

IDFG biologists documented 272³² wolf mortalities³³ in 2009 within Idaho (Mack et al. 2010). Of the known wolf mortalities, at least 248 deaths were human-caused³⁴, 24 deaths were of unknown cause (some of which may have been human-caused), and 2 deaths were of natural causes. Of those 248 mortalities, 135 wolves were harvested legally by hunters, 93 wolves were removed by WS or were legally taken by livestock producers to resolve wolf depredation conflicts with livestock, 12 were killed illegally, and 8 died from other human causes³⁵. Lethal removals for control purposes occurred in 24 packs, 2 other documented groups, and at least 7 unknown wolf groups, and ranged from 1 to 11 individuals per group. Only 2 wolf deaths due to natural causes were recorded, another indication that mortality was underestimated, as more individuals likely

²⁹ The social carrying capacity for wolves will likely be below the biological carrying capacity as wolves are managed in concert with other wildlife values, livestock concerns and management objectives (IDFG 2009a).

³⁰ The reported number of breeding pairs was a minimum count as reproductive status of some surveyed packs was not determined and 28 documented packs were not surveyed for reproductive status.

³¹ Wolf pup counts were conservative estimates because not all pups in monitored packs were observed, and some documented packs were not visited.

³² Three wolves that died in Idaho were members of Montana packs and are reported in Montana Fish, Wildlife and Parks' annual report (Sime et al. 2010). In addition, a radio-collared Idaho wolf was legally harvested in Canada.

³³ This mortality is likely an underestimate of the overall mortality as documenting mortalities of uncollared wolves is difficult.

³⁴ Wolves that were attacking or harassing livestock or dogs could be legally killed under Idaho Code §36-1107, shoot-on-sight permits issued prior to May 4 while wolves were listed under the ESA, or kill permits issued to livestock operators under IDFG authority after May 4, 2009.

³⁵ Human-caused mortality was greatest from September through November, and corresponded to increased lethal control of wolves due to livestock depredations (Sept) and hunter harvest during concurrent wolf and deer/elk hunting seasons (Oct - Nov).

succumbed to non-human-related factors (Mack et al. 2010). Lastly, IDFG was unable to estimate deaths of pups that occurred prior to surveys. Using these mortality data, IDFG estimated the total number of wolves dying during 2009 from various causes at 504 wolves, representing a total estimated overall population mortality rate of 37%. Documented and estimated wolf mortality by cause included harvest ($n = 135$ wolves [documented]; 10% of total estimated population), agency control and other legal take for control ($n = 93$ wolves [documented]; 7% of estimated total population), and all other causes ($n = 276$ wolves [estimated]; 21% of estimated total population) (Table 4-2) (Mack et al. 2010).

Year	Minimum Estimated Year-End Wolf Population ¹	Estimated Mortality from All Causes ²	% Damage Management Mortality for Population ³	% Estimated Mortality for Population ²	% Change in Estimated Wolf Population (from previous year)
2005	518	44	5.0	8.5	+22%
2006	673	68	6.7	10.1	+22%
2007	764	78	6.5	10.2	+9%
2008	856	372	12.6	37	+10%
2009	835	504	11.1	37	-2%
Average	729	213	8.4	20.6	+12.0%

¹ From Figure 4 in Mack et al. 2010.
² Includes known and estimated mortalities from all causes, including public harvest of wolves in 2009.
³ Includes only wolves killed by WS employees and livestock producers to address wolf/livestock conflicts.

The wolf population in Idaho during the early years of wolf recovery was characterized by annual increases of more than 20%, but the population growth rate has slowed in recent years as most of the available habitat has become saturated with wolves, and 2009 was the first year since 1995 that the State’s wolf population did not increase (Table 4-2). Up until 2009, Idaho’s wolf population had continued to increase every year in spite of the increasing number of wolves annually removed by WS and livestock producers to address incidents of wolf predation on livestock. In 2009, the additive mortality of the State’s first regulated wolf harvest season contributed to the prevention of further population growth, and future wolf harvest seasons would presumably be planned to effect further reductions in the statewide wolf population, consistent with Idaho Fish and Game Commission direction (IDFG 2009a). IDFG’s management goal would be to implement high enough levels of harvest to eventually reduce Idaho’s wolf population to the desired 2005 level of around 500 wolves. If this goal is achieved, the adaptive management approach provided for by IDFG (2008a) would then call for a reduced harvest level which would be expected to maintain the statewide population at around 500 wolves. Annual population growth at the 2005 population level was $\geq 20\%$, and IDFG management direction would call for annual removal of a high enough number of wolves to prevent this increase, but maintain the population at around 500 wolves. A year-end estimate of 500 wolves actually equates to a significantly higher number of wolves during the fall of the year, immediately prior to the opening of hunting seasons, and as many as 150 wolves might need to be removed annually (through hunting and damage control actions) to maintain the year-end population at around 500.

Lethal take of wolves in response to depredations might in some cases include removal of up to an entire pack, but there will likely also be cases where no wolves would be taken in response to depredations, similar to the situation that has existed for at least the most recent 5 years in Idaho.

The USFWS and IDFG will continue to monitor and evaluate the wolf population annually to determine the wolf population status. If the Idaho wolf population became threatened under IDFG management, IDFG would either adjust their management strategies to resolve those issues, or the process to evaluate relisting all or parts of the Idaho or NRM DPS under the ESA would occur. Throughout the range of the wolf generally three factors dominate wolf population dynamics: food, human-caused mortality, and source populations (Fuller et al. 2003). These factors are monitored because they would likely play a role in regulating the Idaho wolf population.

Management Actions to Protect Livestock

Under this Alternative, Idaho WS, as requested by and coordinated with IDFG, could continue to recommend non-lethal management methods when deemed practical and appropriate, or lethally³⁶ remove wolves to resolve human/wolf conflicts³⁷. Additionally, livestock producers and/or their agents could legally shoot wolves to protect their livestock under existing IDFG rules and/or under the authority of permits issued by IDFG after confirmation of wolf predation. The level of lethal take of wolves by WS and landowners to protect livestock in Idaho from 2005-2009 was 26 (5%), 45 (6.7%), 50 (6.5%), 108 (12.6%), and 93 (11.1%), respectively, of the end-of-year estimated population (Table 4-2). Using an average of about 65 wolves removed for livestock protection, the number of wolves removed in response to depredations on domestic animals averaged about 9% of the annual end-of-year estimated wolf population from 2005 through 2009. If Idaho's wolf population returns to near the 2005 level, the number of wolves taken in response to depredations would likely be similar to the 26 wolves removed for this purpose in 2005 (Nadeau et al. 2006).

Cumulative Impact on the Idaho Wolf Population

Wolf populations are dynamic and can undergo drastic fluctuations in their abundance. Many studies have examined various levels of mortality and harvest and the impacts these mortality levels have on gray wolf populations. Wolf populations have sustained human-caused mortality rates of 30 to 50% without experiencing declines in abundance (Keith 1983, Fuller et al. 2003). Based on mean pack size of 8, mean litter size of 5, and 38% pups in packs, Boertje and Stephenson (1992) suggested 42% of juveniles and 36% of adults must be removed annually to achieve population stability. Mech (1970) suggests that more than 50% of wolves older than 5-10 months must be killed to "control" the wolf population, but other researchers have indicated declines may occur with human-caused mortality at 40% or less of fall wolf populations (Ballard et al. 1987, Peterson et al. 1984). Gasaway et al. (1983) reported stable wolf populations after early winter harvests of 16 to 24%, and wolf population declines of 20 – 52% after harvests of 42 - 61%. Ballard et al. (1997) suggests that the wolf population remained stable at 53% winter mortality, which included both natural and human-caused mortality. Fuller (1989) observed stable or slight increases in the wolf population at an annual human-caused mortality rate of 29%. It appears that 30 to 35 % human caused mortality of late fall or winter population can be tolerated by most wolf populations without causing population declines (Fuller et al. 2003).

Mech (2001) looked at three scenarios for the management of Minnesota's wolf population when the population was estimated at 2,450 wolves during the winter of 1997-1998: 1) population and range limitation, 2) sustainable harvest, and 3) population reduction. For population and range limitation, an additional number of wolves equal to the annual increase in the wolf population (statewide for population stabilization, in the periphery of occupied range for range limitation)

³⁶ Lethal methods are not needed at all sites where damage is confirmed nor are wolves always captured or killed at each damage situation.

³⁷ Includes take by designated agencies for the protection of human safety. Does not include euthanization of sick or injured wolves (injuries that are not related to actions proposed in this EA).

would need to be taken as long as lethal wolf damage management continued at its present or greater level. Using data from other regions of North America, winter harvests of wolves of 28-47% did not permanently reduce wolf populations for sustainable harvest. Wolf populations have been reduced in Canada and Alaska when 38-80% of the populations were removed during the winter. These populations rebounded after population reduction was ceased (Mech 2001).

Haber (1996) reported that wolf populations may not be able to withstand repeated annual reductions of 25-50%. He believes these removals, in the form of hunting, trapping, and government control efforts, may have impacts on wolf population dynamics, social interactions, and the long-term health of the population. Haber also reported that it is difficult to fully understand the impacts of wolf exploitation because detailed comparative information on behavior from both exploited and protected wolf populations is scarce. Haight et al. (2002) modeled the impacts of various wolf removal strategies for wolf damage management including reactive removal (wolves removed after depredation occurs), delayed corrective removal (wolves removed in winter from areas with a history of wolf conflicts); and population size management (wolves removed annually from all territories near depredation sites). None of the strategies threatened wolf populations unless the wolf population was isolated. The model predicted that populations could withstand a sustained harvest of 20-25%. The authors considered this to be a conservative estimate and that the model likely underestimated compensatory factors in wolf population biology. In their analysis of multiple data sets, Adams et al. (2008) found human-caused mortality rates <29% did not cause wolf population declines.

Under this or any of the other Alternatives, IDFG's adaptive management approach will ensure that the cumulative impacts on Idaho's wolf population do not result in the population going below 500 (IDFG 2008a, 2009a). The USFWS, through their approval of IDFG's Wolf Conservation and Management Plan and their delisting proposal (73 FR 10514-10560), has concurred that ensuring maintenance of at least 15 breeding pairs (~150 wolves) would provide for the long-term maintenance of a viable wolf population in Idaho. The cumulative impacts associated with Alternative 1, (the continuation of the current wolf damage management program in Idaho) in the context of the State of Idaho's desired human environment, are therefore not deemed to be adversely affecting Idaho's wolf population.

If wolves are returned to their prior listed status (endangered north of I-90 and nonessential, experimental south of I-90), WS would likely have to increase the number of wolves taken through depredation control actions as the wolf population would likely increase. As indicated above, even with the inclusion of public wolf hunting under Alternative 1, the cumulative impacts would not be expected to adversely affect Idaho's wolf population (in the context of the desired human environment), and without wolf hunting by the public, the cumulative impacts would be even less.

4.4.1.2 Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates

The integrated and adaptive approach employed under the current wolf damage management program in Idaho typically involves use or consideration of both nonlethal and lethal measures to stop or reduce the likelihood of further wolf damage. In assessing the effectiveness of various management approaches to dealing with wolf predation on livestock in the Northern Rockies, Bangs et al. (2009) concluded that while non-lethal tools were temporarily helpful in some situations, they were generally ineffective, particularly in areas that simply would have too many livestock conflicts for wolf packs to persist. (Scaring wolves away from one specific location in an area with large numbers of livestock everywhere simply results in the wolves killing livestock in adjacent areas where focused nonlethal efforts are not being employed.) Bangs et al. (2009) also

concluded that lethal control of problem wolves was usually effective in reducing conflict because it: 1) enhanced effectiveness of non-lethal control measures, 2) interrupted use of livestock as food by surviving wolves, 3) removed offending individuals, 4) reduced wolf density in conflict areas, 5) eliminated packs where chronic livestock depredations had been occurring, 6) helped to keep wolf packs out of unsuitable habitat, 7) made surviving pack members temporarily avoid or be more wary of people and/or areas with livestock, 8) reduced the pack's overall need for food, 9) made it more difficult for the fewer remaining pack members to kill larger prey like adult cattle or attack calves protected by cows, 10) increased the detection rate of subsequent depredations because livestock carcasses were consumed more slowly (so additional control could be applied more rapidly), 11) reduced compensation and control costs, and 12) moderated some of the public anger over wolf predation on livestock. Mech (1995) similarly concluded that in most circumstances, lethal removal of wolves was usually the only practical approach to resolving incidents of wolf predation on livestock. Karlsson and Johansson (2009) reviewed data on livestock predation by brown bears, wolves and lynx on farms in Sweden and concluded that the risk of predation greatly increased during the first several weeks after an initial predation incident. They suggested that control efforts, whether lethal or nonlethal, would be most effective if applied during this period of time following an initial depredation event.

Although nonlethal methods are often only temporarily effective, they may sometimes offer protection for a long enough period of time to protect a resource when it may be most vulnerable. An example is the use of the RAG in small calving pastures. Breck et al. (2002) reported that this frightening device, activated by the radio signal from an approaching radio-collared wolf, was effective in keeping a radio-collared wolf pack away from several small calving pastures in central Idaho for 60 days. However, this device is only useful in those cases where at least one, and preferably multiple wolves in the pack are radio-collared, and it is only useful for protecting relatively small areas. Fladry has also been used in to deter wolves for up to 60 days before the wolves habituated to it and began killing livestock again (Musiani et al. 2003). One consideration in the use of these temporarily effective non-lethal methods, however, is that if wolves will eventually be lethally removed anyway (after habituating to the frightening stimulus), the investment of time and resources in the nonlethal efforts may not be practical.

One of the most effective non-lethal deterrents to wolf predation may be the on-site presence of humans who remain near the livestock and are vigilant in trying to detect the presence of wolves so they can be consistently frightened away (Shivik 2004). These efforts can be more effective if there are radio-collared wolves in the area and the livestock guardian personnel make use of radio-telemetry receivers to detect the nearby presence of wolves. The costs to provide 24/7 human presence around livestock would ordinarily be cost-prohibitive for livestock producers, but in some situations, outside parties with an interest in wolf conservation have provided such assistance at no cost to livestock producers, in order to promote greater tolerance for wolves. The Defenders of Wildlife have paid for such efforts in the Big Wood River drainage of central Idaho during several recent summer grazing seasons, and while these efforts have not been 100% effective in eliminating wolf problems, they appear to have been effective in reducing the number of wolf attacks on sheep and livestock guarding dogs in this area (USDA 2010).

Bangs and Shivik (2001) reported that while some nonlethal methods may be temporarily effective, many are expensive to implement and none available at the time of their report were widely effective. Many nonlethal methods of preventing livestock losses to wolves have been tried and abandoned in the United States and Europe because of lack of effectiveness. Use of guard dogs alone has been tried against wolves in Minnesota with only limited success (Fritts et al. 1992). Coppinger and Coppinger (1996) showed the dominance of wolves over livestock guarding dogs in direct confrontations, and Coppinger and Coppinger (1996) and Bangs et al. (1998) reported that

wolves have killed livestock guarding dogs. Wolves have also been translocated to other areas, but many either returned to where they were caught or became a problem elsewhere (Fritts et al. 1984, 1985). Mech et al. (1996) concluded that where wolf populations are large and secure, translocation has little value in wolf management. Aversive conditioning (Gustavson and Nicolaus 1987, Shivik and Martin 2001, Shivik et al. 2003) has not yet proven effective with wild wolves (Fritts et al. 1992). Electric fencing may hold some promise for protecting livestock from wolves, but fences tested for coyotes have been extremely expensive, high maintenance, and better suited for small areas (Dorance and Bourne 1980, Nass and Theade 1988, Paul and Gipson 1994), rather than range operations.

In looking at the possible role of livestock husbandry practices in reducing wolf predation, Bradley and Pletscher (2005) assessed multiple factors potentially related to wolf depredations on cattle in fenced pastures in Montana and Idaho. They concluded there was no relationship between depredations and carcass disposal methods, calving locations, calving times, breed of cattle, or the distance cattle were grazed from the forest edge. They did find that depredations were more prevalent in pastures where elk were more likely to occur, where the pastures were larger in size, had more cattle, and where cattle were grazed farther from residences than pastures without depredations. Mech et al. (2000) likewise concluded there were essentially no differences in husbandry practices between farms in Minnesota that suffered chronic wolf depredations, as compared to similar operations which experienced no depredations, and that farms with cattle farther from human habitation suffered more losses.

Haight et al. (2002) and Cochrane et al. (2003) reported on a model developed to assess 3 different strategies for reducing wolf predation on livestock, including: 1) reactive management, where wolf removal occurred soon after depredations occurred, 2) delayed reactive management, where wolf removal occurred in the winter months prior to the grazing season in areas with a history of previous depredations, and 3) population-size management, where wolves were removed annually in the winter months from all areas near farms. The authors' concluded that: 1) each of these approaches reduced predation by about half compared with no action, 2) delayed reactive management and population-size management actually removed fewer wolves than reactive management because wolves were removed in winter before pups were born, and 3) population-size management was least expensive because repeated annual removal kept most territories near farms free of wolves.

Wolf removal to protect wild ungulates is not part of the current wolf damage management program in Idaho, so its effectiveness will not be addressed here, but is addressed in the analysis of Alternative 2.

4.4.1.3 Effects on public and pet health and safety

WS conducted a formal risk assessment of methods proposed for use under Alternative 1 (USDA 1994, Appendix P). The assessment concluded that when traps, snares, aerial shooting, firearms and frightening devices are used by appropriately trained and authorized personnel, in accordance with applicable laws, regulations and agency policy, the current damage management methods pose minimal or no risk to public and pet health and safety. The greatest risks to public and pet health and safety from the use of wolf damage management techniques are incurred by the individuals who use these methods. WS' traps and snares are strategically placed to reduce the likelihood of exposure to the public and pets. Appropriate warning signs are posted at access points to areas or properties where traps or snares are set to alert the public of their presence. There have been no reported injuries to WS or IDFG personnel or the public from WS wolf management activities in Idaho.

Firearm use is a very sensitive issue and a public concern because of fears regarding the potential for misuse of firearms. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). All firearm safety precautions are followed by WS when conducting damage management and WS complies with all laws and regulations governing the lawful use of firearms. Shooting with shotguns or rifles would be used to reduce wolf damage when lethal methods are determined to be appropriate and firearms would be used to euthanize captured wolves in a humane manner. WS employees who use firearms as a condition of employment are required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

This Alternative could provide relief from damage or threats to public health and safety for people who would have no relief from such damage or threats if nonlethal methods were ineffective or impractical. Many people directly affected by wolf depredations on domestic animals, especially pets that are killed in their yards, express concern for human safety and insist upon the removal of wolves from their property when they cause damage. Wolves that have become habituated to humans are unpredictable and may attack people or pets (Section 1.3.4, Linnell et al. 2002, McNay 2002). In many situations where wolves may pose a risk to health and safety, management of human behavior and nonlethal techniques may be sufficient to resolve the problem; however, in some situations, removal of the problem individual may be the most appropriate solution (IDFG 2008a). Perceived threats to human safety from wolves would continue to receive a high priority response from IDFG and/or WS under this Alternative.

4.4.1.4 Humaneness and animal welfare aspects of the methods to be used

WS personnel are experienced and professional in their use of wolf damage management methods. Under this Alternative, wolves would be trapped, snared, or shot by experienced WS personnel as humanely as practically possible. Some individuals would consider this Alternative inhumane because they oppose all lethal methods of damage management. Others will be opposed to this Alternative because they object to specific wolf damage management methods like traps and snares and perceive these methods as being unjustifiably inhumane. Some individuals may prefer that only non-injurious methods such as cage traps be used to capture wolves and would perceive this method as being more humane than foot-hold traps and snares. Unfortunately, the use of cage traps to capture wolves is both impractical and ineffective because it is extremely difficult to get a cage trap large enough for an adult wolf into remote locations, and because it would be highly unlikely to capture an animal as wary as an adult wolf in a cage trap. Individuals with animals that have been injured, threatened or killed by wolves may see this Alternative as being more humane because it reduces the likelihood of continued killing or injury of their livestock and pets by wolves.

4.4.1.5 Impacts to stakeholders, including aesthetics of wildlife

Public reaction would be variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to reduce conflicts/problems between humans and wolves. The impacts of this Alternative to stakeholders would primarily depend on their values towards wolves and their relationship to the damage problem. This Alternative would likely be favored by property owners who are experiencing damage because this Alternative has a likelihood of successfully resolving wolf conflicts, but others may be dismayed with this Alternative if wolves were lethally removed to resolve their damage problem. Individuals

not directly affected by the threats or damage may be supportive, neutral, or totally opposed to any removal of wolves from specific locations or sites. Some individuals would strongly oppose this Alternative because they believe it is morally wrong to kill or use animals for any reason or they believe the benefits from wolves outweigh the associated damage. Individuals totally opposed to lethal wolf damage management methods want agencies to emphasize tolerance for wolf damage and threats to public and pet health or safety. Hunters and other elk enthusiasts may not be entirely supportive of this Alternative because it does not include the option of wolf removal to benefit ungulates. These people may feel their aesthetic experiences are diminished by not getting to encounter elk as often as if wolves were removed to protect elk.

As discussed in Section 2.3.5, wolves could be considered to have high nonconsumptive (*i.e.*, viewing, hearing, photographing) and indirect values (*e.g.*, spiritual, and existence values) for many people. The ability to view and aesthetically enjoy wolves at a particular site could be temporarily limited if the wolves are removed. New animals would most likely reoccupy the site in the future if suitable habitat exists, although the length of time until new wolves arrive is variable, depending on the habitat type, time of year, and population density of wolves in nearby areas. Given the relatively high number of wolves and wolf packs in Idaho (Mack et al. 2010), even under IDFG's proposed reduction of the current wolf population (IDFG 2009a), and given that this action will not jeopardize the viability of the wolf population, other opportunities to view, hear, and aesthetically enjoy wolves will continue to be available to the public. The likelihood of getting to see wolves will probably be greatest for people who have knowledge of wolf behavior and habits and make the effort to visit sites with adequate habitat outside of damage management areas. People interested in seeing or hearing wolves could continue to contact their local IDFG office to inquire about the best opportunities.

The IWDM approach, which includes nonlethal and lethal methods as appropriate, provides relief from threats/attacks on livestock, pets and potentially even people who would have no relief from such damage or threats if nonlethal methods were ineffective or impractical.

4.4.2 Alternative 2 - Expanded Wolf Damage Management Program (Proposed Action, Preferred Alternative)

Under this Alternative, WS would continue to implement an adaptive IWDM program, but could additionally provide assistance to IDFG to protect ungulates in those situations where IDFG has determined that wolves are impacting the ungulate population in a specific management area. IDFG would continue to conduct monitoring in management zones across the state as part of their ongoing efforts to determine wolf populations and to meet ungulate population management objectives. In some management zones (*e.g.*, currently the Lolo and Selway Zones) there have been indications that wolf predation is one of the primary reasons for declining numbers of elk, and wolf control is part of an IDFG- approved Mammal Predation Management Plan for these zones (IDFG 2010b) . Under this alternative, WS could perform wolf control activities in response to IDFG requests to implement Predation Management Plans.

In addition WS activities could potentially include 2 additional methods not employed under the current program. One of these methods could be the potential use of surgical sterilization of alpha pairs of wolves in those situations where there has been a chronic history of depredation on livestock, and where the entire pack has been slated for removal. This approach might potentially be employed to protect either livestock or ungulates, depending on the circumstances. The other method which might infrequently be used under this Alternative would be the gas cartridge to humanely euthanize wolf pups in dens, in those cases where IDFG had authorized removal of an entire pack.

4.4.2.1 Effects on the wolf population in Idaho

As with Alternative 1, the primary factors influencing the wolf population in Idaho and the NRM are prey density and human-related mortality. Wolf monitoring by IDFG (2008a) would identify excessively high mortality rates or low birth rates and would trigger timely corrective action (*e.g.*, reductions in allowable take for wolf damage management, sport harvest, measures to address the source of the high mortality rates or low birth rates) when necessary.

Under this Alternative, with a delisted wolf population, cumulative impacts to Idaho's wolf population would not be expected to be appreciably different than under Alternative 1, where WS would conduct no wolf removal to protect ungulates. As discussed in Section 4.4.1.1, under the adaptive management approach being followed by IDFG, if wolf removal by one approach is reduced, it would likely be compensated for by increasing wolf removal through one or more other approaches. Whether WS is involved in assisting IDFG with wolf removal to protect elk or not, the Idaho Fish and Game Commission's wolf population objective would still remain at around 500 wolves (IDFG 2009a). IDFG has indicated they would like to take advantage of the resources and expertise available through WS to conduct wolf removals for protection of elk, but they have also indicated that if WS is unable to assist in conducting these wolf removals, they would accomplish the desired wolf removal themselves through other available means (Compton 2009).

If wolves in Idaho south of I-90 are returned to their former nonessential, experimental population status as a result of the delisting decision being overturned in court, then the effect of Alternative 2 on Idaho's wolf population could conceivably be different. IDFG could still authorize WS wolf removal to protect elk with the approval of USFWS under provisions of the applicable 10j rule, but the inability to allow public hunting of wolves would likely result in continued wolf population growth. With continued wolf population growth, wolf damage to livestock and ungulate populations would be expected to increase, and WS' take of wolves would be expected to increase. The overall cumulative impact of this increased take, however, would likely be less than the cumulative impact resulting from also allowing public harvest of wolves.

Although it would not be expected to appreciably affect the cumulative impacts on the wolf population, the sterilization of alpha pairs of wolves under this Alternative, as an alternative to killing them, would likely result in fewer wolves being killed during control actions (Mech et al. 1996, Haight and Mech 1997). To the extent that more alpha pairs were sterilized in chronic depredation areas, fewer wolves would likely have to be killed in future control actions.

After any management action ends, the wolf population would be expected to eventually return to pre-removal levels dependent on location, prey base, time of year, dispersal rates/immigration, etc. (National Research Council 1997). For example, in east-central Alaska, wolf abundance returned to pre-management levels in 3-years following 7-years of management removals that reduced the population 55-80% (Gasaway et al. 1983). Wolf population growth rates vary widely which is a function of survival rates, immigration, and indirectly, prey abundance (Fuller 1989). Population growth on the order of 50% per year is possible (Hayes 1995, Ballard et al. 1997). Growth rates are typically high following management efforts owing to the increased per capita supply of prey (Fritts and Mech 1981, Keith 1983, Ballard et al. 1987). Consequently, once a wolf population is reduced to a desired IDFG management level, it may be necessary to maintain that level during subsequent years and until the desired ungulate management objective is reached.

4.4.2.2 Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates

Effectiveness of the various lethal and nonlethal control strategies employed under Alternative 2 to

protect livestock would be similar as under Alternative 1, but Alternative 2 would additionally provide for use of these same tools and methods to protect localized ungulate populations at the direction of IDFG. Although the surgical sterilization of alpha wolves (as an alternative to killing them) has not been tested as an approach to reducing predation on livestock, it has been successfully employed to reduce predation on big game animals (Hayes et al. 2003). If experience indicates that this approach could be effective in reducing wolf predation on livestock, then to the extent it might eventually be employed under Alternative 2, this Alternative could conceivably be more effective than the integrated approach employed under Alternative 1, which does not include sterilization as an option.

Gasaway et al. (1983) reviewed and evaluated data regarding the interrelationships between wolves, moose, and caribou, and management approaches employed in interior Alaska from the 1950's through the 1970's. The authors concluded that predation by wolves can exert substantial control over ungulate populations, as demonstrated by wolf removal experiments, and that when wolf predation limits a depressed ungulate population, managers can either wait for a natural recovery, which could take decades, or reduce numbers of wolves. Gasaway et al. (1992) reviewed and evaluated data on nutrition, snow levels, human harvest, disease, and predation in limiting moose populations in east-central Alaska. They identified predation by wolves and bears as the most important limiting factor in holding moose populations at low densities during the period of 1976-1988. Moose numbers increased simultaneously with a predator reduction program in their study area.

Hayes et al. (2003) assessed the results of a 5-year effort to reduce wolf populations in southwestern Yukon, where caribou, moose, and Dall sheep populations were declining. Wolf numbers were reduced through aerial shooting, trapping, snaring, and surgical sterilization of live-captured wolves. The authors indicated that wolf control was effective in increasing ungulate populations in their study area, and that sterilization was effective in reducing the rate of wolf population increase. They also indicated sterilization was more publicly acceptable than killing wolves. Boertje et al. (1996) likewise concluded that reducing wolf numbers led to substantial increases in moose and caribou populations in southeastern Yukon. Benefits of the wolf removals included the harvest of several thousand more moose and caribou in their study area than predicted if wolf control had not occurred. Boertje et al. (1995) assessed the biological effectiveness of several methods of increasing predation-limited moose populations in Alaska and Yukon, and concluded that aerial shooting of wolves was one of the most effective approaches, whereas wolf sterilization was ranked as low to moderate in effectiveness.

Part of the rationale for the lower effectiveness ranking for sterilization, however, was that it was logistically challenging to capture and surgically sterilize wolves. The logistical challenge might not be as big a factor with experimental implementation of sterilization as proposed under Alternative 2, particularly where trapping was being used as a primary control method. Sterilization would only be undertaken in those cases where an entire pack was slated for lethal removal, so the capture effort would already be occurring anyway. If the pack removal effort was occurring primarily by trapping, and an animal believed to be a breeding (alpha) wolf was captured, it could be opportunistically sterilized, radio-collared and released, as an alternative to killing it. Judgments about whether a captured wolf was a breeding animal would be based either on known status of existing radio-collared alpha animals, evidence of nipple development in the case of breeding females, or assumptions based on size and age of the animal in the case of breeding males. If helicopter aerial shooting was being employed in attempts to remove all the members of a chronic depredating pack, there could also be the option of live-capturing suspected or known alpha wolves instead of killing them, through the use of tranquilizer darting instead of shooting.

4.4.2.3 Effects on public and pet health and safety

Under this Alternative WS' effects on public and pet health and safety would not be expected to significantly differ from Alternative 1. The only additional methods or tools which might potentially be employed under Alternative 2, as compared to Alternative 1, would be the possible use of surgical sterilization of alpha pairs of wolves, and the possible use of gas cartridges to euthanize pups in a den in those infrequent circumstances where a chronic depredating pack of wolves was slated for removal during the spring of the year when pups might still be in a den. Both of these methods would be used infrequently, at most, and neither of these methods would be expected to pose any increased level of risk beyond the already low level of risk to public and pets associated with the methods employed under Alternative 1.

4.4.2.4 Humaneness and animal welfare aspects of the methods to be used

Under Alternative 2, all the same methods would be employed in the same manner as in Alternative 1, but the potential additional use of sterilization of alpha wolves (as an alternative to killing them) might be considered more humane than killing them. To the limited extent it might be used, this approach might also improve animal welfare by contributing to reduced numbers of livestock being maimed and killed during wolf attacks, and by reducing the number of wolves that might potentially have to be killed. Likewise, if gas cartridges were ever used to euthanize pups from chronic depredating packs, that method might be considered more humane than other lethal control methods which might otherwise be employed, or than leaving the pups defenseless and subject to predation or starvation.

4.4.2.5 Impacts to stakeholders, including aesthetics of wildlife

A similar wide and variable range of public feelings towards wolves and wolf damage management would likely be present under Alternative 2 as in Alternative 1, since both Alternatives are substantially similar. The primary difference between Alternative 2 and Alternative 1 is that under Alternative 2, WS would likely in some instances be providing assistance to IDFG in conducting wolf removals to protect elk. Some members of the public, primarily hunters and other individuals concerned about the impacts of wolf predation on ungulates, may prefer this Alternative. Some people may object to wolf control rather than "letting nature take its course," or for wolf control to support human hunting of ungulates. Other people may be concerned that the potential additional wolf removals which might occur would detract from their opportunities to see or hear wolves in the wild. For determined individuals, however, many opportunities to see or hear wolves, or experience other evidence of their presence, would still exist under Alternative 2, particularly if those individuals seek out areas where wolf control efforts to protect elk or livestock have not recently occurred.

4.4.3 Alternative 3- Nonlethal Wolf Damage Management Only.

4.4.3.1 Effects on the wolf population in Idaho

Under this Alternative, WS would not conduct any lethal wolf control and would have no impact on the wolf population in Idaho. However, with a delisted wolf population, IDFG rules allow all Idaho landowners and livestock producers to haze, harass or kill a wolf that is molesting or attacking livestock or domestic animals on public or private land, with the provision that all such incidents must be reported to IDFG within 72 hours. Additionally, IDFG could continue to issue wolf kill permits to landowners and livestock producers who have experienced confirmed wolf

predation on their private property or their Federal or State grazing lease. IDFG could also exercise its own authority to remove wolves in those cases where wolves have been documented to be contributing to a decline in ungulate populations in a specific management area. And, as long as wolves are delisted, IDFG could continue to authorize wolf take through regulated public hunting and trapping seasons for wolves. As discussed under Sections 4.4.1.1 and 4.4.2.1, under the adaptive management approach being followed by IDFG, if wolf removal by one approach is reduced, it would likely be compensated for by increasing wolf removal through one or more other approaches. If WS were not taking any wolves through lethal control, IDFG would likely authorize additional take by other means in an attempt to compensate for this reduction in take by WS. Wolf hunting opportunities for the public might be expanded by offering opportunities for depredation hunts in areas where wolves have been or are currently killing livestock. This type of approach might not be as effective in targeting individual depredating wolves and packs and addressing damage problems as lethal control efforts conducted by WS under Alternatives 1 or 2, but it might eventually result in just as many wolves being removed from the population.

If the wolf delisting decision is overturned as a result of litigation, however, Alternative 3 would likely have a lower cumulative impact on Idaho's wolf population than Alternatives 1 or 2. If wolf management were to revert to the 10j rules in place with a nonessential, experimental wolf population, wolves could still be killed by livestock producers when witnessed attacking livestock, and IDFG might still exercise the option of controlling wolves (without WS assistance) to address impacts on ungulates. IDFG might also conduct some wolf removal efforts on their own in response to complaints of predation on livestock. But IDFG would not have the option of providing for a hunting season to reduce the wolf population or focus harvest in conflict areas. The combination of no wolf removals by WS and no wolf removals through a public hunting season would likely result in an increase in Idaho's wolf population and increased wolf damage, rather than the decrease desired by IDFG (2009a). There would likely be frustration on the part of livestock producers and hunters because of increased impacts from a growing wolf population, and some degree of illegal wolf killing would likely occur, but it would not likely be enough to compensate for the lack of removals by WS and a regulated public harvest.

4.4.3.2 Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates

As discussed in Section 4.4.1.2, while nonlethal methods can be temporarily effective, lethal removal of wolves is usually the only practical approach to resolving incidents of wolf predation on livestock (Mech 1995, Bangs et al. 2009). Under Alternative 3, WS would not use any lethal control, and WS efforts would not be nearly as effective in reducing or preventing wolf predation on livestock. Some wolf depredation problems could be temporarily addressed through implementation of nonlethal methods, but livestock producers would probably try to increase their own legally available lethal control in the absence of WS lethal control. Livestock losses to wolves would likely increase under Alternative 3 since it would be difficult for livestock producers and/or IDFG personnel to devote the required time, resources, and expertise to adequately address depredation problems. Nonlethal methods for preventing wolf predation on ungulates would not be practical, but IDFG could conduct their own lethal control efforts to address ungulate impacts, or they could enlist the cooperation of private individuals as designated agents in such efforts. The overall efficacy of this Alternative might largely depend on whether or not IDFG were able to establish an equally prompt and effective wolf damage management program in the absence of WS lethal control.

4.4.3.3 Effects on public and pet health and safety

Under Alternative 3 there would be no lethal wolf damage management activities conducted by

WS, so the already low level of potential risk to the public and pets associated with any WS lethal control efforts would be eliminated. However, the risk to the public and domestic animals from wolf predation would likely increase. In the absence of lethal control of depredating wolves by WS, property owners and others affected by wolf depredations would likely begin to exercise their own lethal control efforts. In some cases, frustration with continued depredations might lead some individuals to consider use of illegal toxicants or trapping methods to effect wolf removals, and this could potentially result in harm to people's pets. (In 2006 a rural resident from central Idaho pled guilty to illegally placing poisoned meatballs on Salmon-Challis National Forest lands in an effort to kill wolves. Three pet dogs were poisoned as a result of his actions.) Although non-target hazards can be significant, the motivation to use toxicants can be great, because a variety of potentially useful agricultural pesticides are readily available at relatively low cost, and would be easy to deploy (Allen et al. 1996). If the wolf delisting decision were overturned as a result of litigation, and wolf numbers began to increase again, the likelihood of illegal wolf killings would probably increase.

Although no lethal control would be conducted by WS, IDFG could still authorize its personnel or private individuals to use foot-hold traps and snares to take depredating wolves. WS posts warning signs to alert members of the public about deployment of capture devices, but those types of notices would not necessarily be posted by private individuals conducting trapping efforts.

4.4.3.4 Humaneness and animal welfare aspects of the methods to be used

Because WS would not be conducting any lethal control of wolves under Alternative 3, some people would consider WS' actions under this Alternative more humane than Alternatives 1 and 2. Although WS would be limited to using only nonlethal methods, a variety of lethal methods could still potentially be employed by livestock owners and their agents to address wolf depredations, and IDFG could implement lethal control methods or authorize members of the public to take wolves to address depredation issues. If the entities conducting the lethal wolf management lack the training, experience and resources of WS personnel, there may be a greater risk of unnecessary injury or pain from less than optimal use of some techniques. It is conceivable, and perhaps even likely, that in some cases, since individuals experiencing wolf damage could not rely on WS to remove wolves, there may be frustrated attempts to remove wolves through the illegal use of a readily available variety of agricultural pesticides or through illegal trapping methods. Depending on the illegal toxicant or trapping methods used, death might occur over a protracted period of time and involve a great deal of suffering, as compared to other methods such as shooting (Allen et al. 1996)

4.4.3.5 Impact to stakeholders, including aesthetics of wildlife

The impacts of this Alternative to stakeholders would be variable depending on their values regarding wildlife and relationship to the problem. Individuals directly impacted by wolf depredation are likely to be less tolerant of wolves than individuals whose property and pets are not at risk. Under Alternative 3 WS would limit assistance to only nonlethal methods, but IDFG could conceivably provide assistance with lethal control in response to confirmed wolf depredations. If stakeholders experiencing wolf damage receive quick and effective service from WS and/or IDFG, they would likely be more accepting of wolves and the program. However, if depredation complaints are not readily addressed, stakeholders experiencing wolf damage would likely oppose this Alternative.

IDFG could still conduct wolf removals to protect ungulates (but without WS assistance) under this Alternative, and different members of the public would be opposed to or supportive of this management action, depending on their particular interests. As with Alternatives 1 and 2, there

would continue to be opportunities to see and hear wolves, or experience other evidence of their presence, particularly if individuals seek out areas where IDFG or private property owners have not recently conducted wolf removal efforts. Members of the public could continue to contact their local IDFG office to inquire about the best opportunities for wolf viewing.

4.4.4 Alternative 4 - No Federal Wolf Damage Management in Idaho

4.4.4.1 Effects on wolf populations

The impact on Idaho's wolf population as a result of implementing Alternative 4 would likely be similar to the impacts associated with implementation of Alternative 3, since under both of these Alternatives, there would be no wolves removed by WS. All of the non-WS take of wolves discussed under Section 4.4.3.1 would be similarly likely to occur under Alternative 4. As also discussed under Section 4.4.3.1, if the wolf delisting decision is overturned as a result of litigation, Alternative 4 would likely have a lower cumulative impact on Idaho's wolf population than Alternatives 1 or 2, for the same reasons as discussed in Section 4.4.3.1.

4.4.4.2 Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates

Similar to the implementation of Alternative 3, the degree to which implementation of Alternative 4 would likely be effective in addressing wolf predation on livestock and/or wild ungulates would probably depend largely on how effective IDFG was in carrying out a similar type of wolf damage management role that WS has historically carried out. It is conceivable that IDFG or some other entity designated by IDFG might eventually attain the resources and expertise to similarly conduct wolf damage management as effectively or more effectively than WS. But in the mean-time, implementation of both lethal and nonlethal methods by other entities would likely not be as effective as when carried out with the assistance of WS. An example would be the use of the RAG electronic frightening device to deter wolves from livestock pastures. These devices are complex to maintain and operate effectively, and each unit costs several thousand dollars. Aerial shooting would be another example of a control method that is highly effective, but requires specialized training and equipment to be conducted effectively.

Frustration with wolf management and levels of wolf damage may be highest for this Alternative, especially initially, before some other entity besides WS begins effectively providing assistance with wolf damage problems. Control efforts by untrained individuals with a lack of knowledge about control methods and wolf biology and behavior are less likely to target specific depredating wolf packs or individuals, and less likely to be effective in resolving damage problems (Mech 1995).

4.4.4.3 Effects on public and pet health and safety

We anticipate that IDFG would place the highest staff priority on responding to issues of risk to human health and safety and would not delegate response to these risks to personnel who lack the training and experience to effectively address these concerns. Consequently, risks to human health and safety from wolves would be similar to Alternatives 1 and 2.

It is reasonable to assume that whatever wolf damage management program IDFG implements in the absence of WS, there would be an increase in the number of individuals attempting to resolve wolf damage problems who lack the training and experience of IDFG and WS personnel. There would likely be more trapping and shooting permits issued to landowners who had lost livestock to

wolf depredation. Less experienced individuals may require more time to resolve a damage problem which would result in an increase in the amount of time traps and snares are in use. The overall result of these changes could be an increase in the number of pets that are captured in equipment placed for wolves. Private individuals who would be authorized to conduct wolf control through shooting and trapping permits are not required to follow all Federal policies that WS personnel are required to follow which may also lead to increases in risks to pets and human safety.

4.4.4.4 Humaneness and animal welfare aspects of the methods to be used

This Alternative might be considered more humane by many people who are opposed to lethal control methods employed by WS, but lethal control of wolves would likely continue regardless of whether WS were involved. IDFG could still use traps and snares to capture and euthanize depredating wolves and to radio collar wolves for population monitoring and nonlethal wolf damage management techniques which require a collar on the wolf. When capturing wolves for population monitoring, and nonlethal or lethal management efforts, wolves would be humanely captured by experienced personnel using the best methods available. However there would likely be a greater dependence on private landowners who would be issued trapping and shooting permits. These individuals would likely be less trained and experienced than IDFG or WS personnel, and might not employ the most appropriate tools and methods.

Some property owners may take illegal action against localized populations of wolves out of frustration where continued damage occurs in the absence of a quick and effective wolf damage management program. Some illegal methods, like poisons, may be less humane than methods used by experienced agency personnel. Humaneness and animal welfare may decline for some livestock and pets because overall efficacy in addressing damage problems would be lower than with Alternatives 1, 2 or 3.

4.4.4.5 Impact to stakeholders, including aesthetics of wildlife

Like Alternative 3, some stakeholders who are opposed to WS use of lethal methods may view this Alternative favorably, while others who are impacted by wolf damage would likely view this Alternative unfavorably, particularly if they felt they would be receiving little or no assistance from any Federal or State agencies to help address wolf damage problems. IDFG could continue to provide assistance with wolf damage problems, but the strain on IDFG resources and staff and costs to other programs would be greatest under this Alternative. If IDFG had to re-direct resources from other program areas to make more resources available to address wolf damage, that could have a negative impact on members of the public who depend on IDFG to provide abundant fish and wildlife, whether for consumptive or non-consumptive use. In addition to increased issuance of permits for landowners, it is likely that IDFG could seek other individuals to use as designated agents who could respond to damage problems. It may be difficult for IDFG to obtain and retain individuals with the training and experience of WS. Consequently, damage problems may not be resolved as effectively or efficiently as with Alternatives 1 and 2. Ranchers and pet owners with wolf depredation would likely be more frustrated because of the lack of quick response to losses. Individuals who feel their aesthetic enjoyment is compromised by the knowledge that wolves could be killed for wolf damage management may still be dissatisfied under this Alternative because lethal control would still be conducted, by sources other than WS.

This Alternative is not anticipated to result in a decline in wolf abundance in Idaho or the NRM and any difference in wolf viewing opportunities is likely to be negligible. Opportunities to view, hear and aesthetically enjoy wolves would continue to be available to people who visit sites with adequate habitat outside of the damage management area.

4.5 SUMMARY OF IMPACTS

Table 4-3 briefly summarizes the potential impacts of each Alternative against each of the issues that were analyzed in detail. The anticipated impacts on Idaho's wolf population from the various Alternatives would differ to some degree depending on whether wolves remain delisted and under State management, or are returned to State management under their previously listed status. None of the 4 Alternatives would be expected to adversely affect Idaho's wolf population, regardless of listing status, since the 2005 target population level is considered a viable, sustainable population. People opposed to lethal control of wolves may also be opposed to implementation of Alternatives 1 and 2, but as discussed in the EA, lethal control of wolves is expected to occur regardless of whether WS is involved or not.

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Table 4-3. Summary of Impacts

	Alternative 1 - Continue the Current Wolf Damage Management program (No Action).	Alternative 2 - Expanded Wolf Damage Management Program (Proposed Action, Preferred Alternative)	Alternative 3 - Nonlethal Wolf Damage Management Only	Alternative 4 - No Federal Wolf Damage Management in Idaho
Effects on Idaho's wolf population (while delisted)	Moderate, when considered in the context of the desired human environment, which would be about 500 wolves in Idaho, according to the Idaho Fish & Game Commission. This is considered a viable, sustainable population level.	Similar as to Alternative 1, since additional wolves potentially removed under this Alternative would be compensated for by reducing the number of wolves taken by other approaches to ensure that the population did not go below the 2005 level of around 500 wolves.	Cumulative impact on the Idaho wolf population would likely be somewhat less than under Alternatives 1 and 2, unless/until IDFG were able to provide for other forms of lethal corrective wolf removal to replace WS wolf removals.	Cumulative impact on Idaho's wolf population would likely be similar as under Alternative 3
Effects on Idaho's wolf population (if relisted)	Low to moderate, since public harvest seasons would not be an option. Idaho's wolf population would likely continue to increase, rather than be reduced to the desired 2005 population level.	Similar as under Alternative 1.	Even lower than the effects on the wolf population under Alternative 1.	Similar as under Alternative 3.
Effectiveness of lethal and nonlethal control efforts in reducing wolf predation on livestock and/or wild ungulates	The current integrated, adaptive program's effectiveness is good for protection of livestock, but the current program does not include efforts to protect ungulates.	Potentially better effectiveness under this Alternative for protection of both livestock and wild ungulates, if it turns out that sterilization, as proposed, would be another effective tool to address wolf damage.	Much lower effectiveness for WS efforts than under the integrated approach of either Alternatives 1 or 2, but effectiveness could eventually increase as other non-WS entities became proficient in conducting lethal control to address wolf damage problems.	Similar as under Alternative 3.
Effects on public and pet health and safety	Low risks to the public and peoples' pets.	Similar risk as under Alternative 1.	Probably greater risks than under Alternatives 1 and 2.	Similar as under Alternative 3.
Humaneness and animal welfare aspects of the methods to be used	Control methods are employed as humanely as practical. There would continue to be trade-offs between the welfare of wolves and the welfare of domestic animals attacked by wolves.	Similar as under Alternative 1.	Possible increased likelihood that frustrated private individuals would employ less humane methods, such as illegal toxicants or trapping methods.	Similar as under Alternative 3.
Impact to stakeholders, including aesthetics of wildlife	Impacts would be variable and mixed because of differing philosophical, aesthetic, and personal attitudes, values, and opinions.	Similar impacts as under Alternative 1.	Variable and mixed, as under Alternatives 1 and 2, but impacts to livestock producers and those concerned for certain ungulate populations would likely be worse than under Alternatives 1 and 2, at least until IDFG or some other entity were able to become proficient in conducting lethal control to address wolf damage problems.	Similar as under Alternative 3.

APPENDIX A

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APPENDIX B

DEPREDATION INVESTIGATION FORM

U.S. DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE WILDLIFE SERVICES		REPORT NUMBER
WILDLIFE SERVICES DEPREDATION INVESTIGATION REPORT		DATE COMPLAINT RECEIVED
SPECIES	NAME OF INVESTIGATOR(S)	DATE INVESTIGATED
NAME AND ADDRESS OF LIVESTOCK OWNER/LEASEE		TELEPHONE NUMBER
		COUNTY
LAND OWNERSHIP <input type="checkbox"/> STATE <input type="checkbox"/> BLM <input type="checkbox"/> TRIBAL <input type="checkbox"/> PRIVATE <input type="checkbox"/> FS <input type="checkbox"/> OTHER (Specify)		TYPE OF LIVESTOCK/PROPERTY <input type="checkbox"/> HORSE <input type="checkbox"/> BEES <input type="checkbox"/> SHEEP <input type="checkbox"/> CATTLE <input type="checkbox"/> OTHER (Specify)
LOSSES AND/OR PROPERTY DAMAGE (See criteria on reverse side of form)		
No. Confirmed	No. Probable	No. Possible/Unknown
		No. Other (Specify)
SITE DESCRIPTION/PHYSICAL EVIDENCE PRESENT (i.e., tracks, scat, hair, blood, signs of struggle, scrapes, etc.)		
CARCASSES/PROPERTY DAMAGE CHARACTERISTICS (i.e., puncture marks, feeding patterns, measurements between canines, signs of hemorrhage, etc.)		ESTIMATED TIME SINCE PREDATION/DAMAGE OCCURRED (Days/hours)
ACTIONS TAKEN		DATE STARTED
		DATE ENDED
NAME OF WS INVESTIGATOR	SIGNATURE	DATE
NAME OF DISTRICT SUPERVISOR	SIGNATURE	DATE
NAME OF STATE REPRESENTATIVE	SIGNATURE	DATE
DISPOSITION OF CARCASS/PARTS		

WS FORM 200 (OCT 99) COPY DISTRIBUTION: WHITE - State Office YELLOW - District Supervisor PINK- State GOLDENROD- Investigator

CRITERIA FOR CLASSIFICATION OF REPORTED DEPREDATION INCIDENTS

Reported wolf, bear, or lion depredation incidents should be classified as either **confirmed, probable, possible/unknown, or other**, based on the following criteria. *For MIS reporting purposes, "reported" damage may often include incidents described as **probable, possible/unknown, and/or other**, if the cooperators first reported these incidents as predation.*

CONFIRMED – Depredation is **confirmed** in those cases where there is reasonable physical evidence that an animal was actually attacked and/or killed by a predator. The primary confirmation factor would ordinarily be the presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the attack occurred while the victim was alive, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh tracks, scat, hairs rubbed off on fences or brush, and/or eye witness accounts of the attack may help identify the specific species or individual responsible for the depredation. Predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the carcass has already been consumed by the predator or scavengers) **if** there is other physical evidence to confirm predation on the live animal. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other victims for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed predation on the animal that has been largely consumed.

PROBABLE – Having some evidence to suggest possible predation, but lacking sufficient evidence to clearly confirm predation by a particular species, a kill may be classified as **probable** depending on a number of other factors such as: (1) Has there been any recently confirmed predation by the suspected depredating species in the same or nearby area? (2) How recently had the livestock owner or his employees observed the livestock? (3) Is there evidence (telemetry monitoring data, sightings, howling, fresh tracks, etc.) to suggest that the suspected depredating species may have been in the area when the depredation occurred? All of these factors, and possibly others, should be considered in the investigator's best professional judgment.

POSSIBLE/UNKNOWN – Lacking sufficient evidence to classify an incident as either confirmed or probable predation, the **possible/unknown** classification is appropriate if it is unclear what the cause of death may have been. The investigator may or may not have much of a carcass remaining for inspection, or the carcass may have deteriorated so as to be of no use. The investigator would want to consider if the area has been frequented by a predator, or if the habitat is one which the predator is likely to use. Possible predation may include cases where counts show that abnormal numbers of livestock are missing or have disappeared above and beyond past experience, and where other known cases of predation have occurred previously in the area.

OTHER – Cause of livestock deaths should be classified as **other** when it is discovered that the cause of death was not likely caused by the animal originally reported to Wildlife Services during a request for assistance. Examples of **other** may include cases where the cause of death is confirmed or is likely due to predation by some other animal or cause determined at the time of the investigation such as red fox instead of coyote or other causes such as, bloat, poisonous plants, stillborn, disease, lightning strike, vehicle collision, etc. If the specific other cause of death can be determined, it should be written in the space provided for Other.

APPENDIX C

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